

AN EDUCATIONAL TECHNOLOGY POLICY  
FOR MALTA

Charles J. Farrugia

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## ABSTRACT

Charles J. Farrugia

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The dissertation proposes an educational technology policy for Malta aimed at helping the Islands' educational system meet and improve its growing commitments. It sets forth the rationale for the policy by illustrating how past restrictions to educational development in Malta can be overcome by better utilization of the Islands' human and material resources. Defining Educational Technology as the application of rigorous scientific methods to solving educational problems, it develops the structure and content of the policy, and outlines its underlying concepts and fundamental principles in such areas as curriculum and methodology reform, educational materials development, and resources utilization. It delineates the role of teacher-training and the realization of the policy; it outlines the structure and function of an educational technology centre to provide the intellectual, administrative and logistical framework within which the policy can be implemented. Finally, it suggests how the policy can be executed with maximum benefits at minimum costs to the Ministry of Education.

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## INTRODUCTION

Our world is a world of change. It has always been, only now the change is faster, more widespread, more far-reaching. Technology the prime mover in Twentieth Century change has altered our traditional concepts of space and time, has transmitted the Information Explosion and has created what McLuhan calls the Global Village. Technology has enabled man to develop (in posse if not in esse) a global awareness of heterogeneous cultures, and diverse lifestyles. Technology is fashioning his outlooks, his environments, his ecology. In the process, traditional behaviours, age-old concepts and time-honoured values are being swept away.<sup>1</sup>

Traditional behaviours, age-old concepts and time-honoured values in education cannot evade change. The once accepted aims of teaching and learning, the relationships between learners and teachers, the idea of rigid classroom arrangements and time schedules, the

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<sup>1</sup>The prominent authors concerned with the effect of technological change agree that technology is shaping man's life. They disagree on whether it is shaping this life for the better or for the worse. Such writers as Ellul (1964), and Grant (1969) see man as the slave of technology, relinquishing his higher intellect to be subjected by the sterile logic of machines. Others like Toynbee (1971) and Mumford (1970) regard technology as a product of man's endeavours, and are confident that he will be able to control it. Some, represented by Galbraith (1967) and Fuller (1969) regard further developments in technology as a means of controlling it and as essential for man's survival.

normal duration of schooling in a person's life, and the exigency of conventional school itself, are being questioned. The demands for change in education are ever pressing.

At this point one might well heed Leo Fernig's advice on launching International Education Year when he suggested that:

...we need to pause for a moment in this vast and continuing enterprise of education, and see what we are doing, how fast we are going and where we think we want to go. In the course of such reflection it is likely that we will discover that we are attempting to face a twentieth or twenty-first century world with institutions and methods which date back to the nineteenth and eighteenth century (1970, p.4).

The world has to tackle the increasing demands placed upon it by the rapid population growth, the extension of life expectancy, the new social awareness and the accompanying consciousness of the right to education. The educational world has to tackle the problems created by the vast progression of knowledge, the extraordinary developments in the media of communication, the liberation in cultural and social mores, and new concepts of work and leisure. Above all, the educational world has to take account of and plan for the unparalleled and continuous evolution of scientific and technological knowledge.

These factors are making unprecedented demands on educational systems which, besides having to provide schooling in the conventional primary, secondary and higher levels, are finding it necessary to extend their educational services to other areas, mainly: (1) to ensure the job mobility of people, to provide for the unemployed, and to make job "dropouts" caused by technological change re-employable: (2) to help already qualified people keep up-to-date with new knowledge

and technologies to ensure continuous high productivity; and (3) to satisfy the needs of people who wish to enrich their social and cultural life. Furthermore, many countries have ceased considering expenditure in education solely as a sound investment in national growth (Harbison, 1965; Phillips, 1970). Supporting this argument Henri Dieuzeide (1970, p.6) cites the example of Denmark and Japan and shows how both countries, in spite of their limited physical natural resources as compared with their neighbouring countries, succeeded as early as the end of the 19th Century in reaching a high standard of living. Both countries, points out Dieuzeide, succeeded by accentuating their educational system.

Denmark, which introduced compulsory elementary education in 1814, was able to re-structure her agricultural system within a few years when in 1900, wheat from the U.S.S.R. and U.S.A. flooded its markets. Other European countries with lower educational standards were unable to respond to this exterior pressure so quickly. Dieuzeide also attributes the rapid progress of industrialization in Japan to the expansion of the educational system. He shows that in 1900, eighty-two per cent of the Japanese population had an elementary school education and thirty-one per cent had a secondary school background, figures which were higher than in the Western hemisphere. Harbison and Myers compared the educational index with the per capita index of six countries and found that the ratings between the two factors were closely related for all six (1964).

Many countries have come to realize that Lengrand's contention that "A man who does not keep up to date is condemned to be overtaken" (1970, p.15) applies equally well to nations as a whole. Consequently

educational programmes are assuming an ever increasing place of importance in national manpower and development projects on the assumption that "la litterature est nourriture." The new demands, however, put extra strain on traditional educational systems and their sources of income which, already condemned by their structure, are overtaxed with the need to meet the increasing demands for conventional schooling. "Fortunately." points out Maheu, "the need for changes in education arises at a time when media of communication ... and new methods and techniques of instruction, ..., have come on the scene" (1967, p.5). He suggests that the task of educational systems now is to determine what is the appropriate place of the methods and techniques in the educational process and in what way they can be interwoven into the traditional ones to meet the new demands placed on them. Bereday (1969) makes much the same suggestion, with one important distinction, namely that new methods and resources should be considered only after educational needs are established and appraised, so that the introduction of new techniques and apparatus does not become an end in itself but a means to meeting specified educational needs. Bereday's suggestion underlines the considerations and recommendations to be found throughout this work.

The objectives of this dissertation is to propose a policy on how educational technology can become an effective stimulus to improve educational opportunities in Malta.

The nature of this work is analytic, comparative and prescriptive. It analyses the various factors that effect educational technology in Malta, ranging from the social, cultural, traditional, to administrative and pedagogical. It considers Malta's situation in the light of studies



that have been carried out in other countries, and from whose experience Malta may benefit. This is not an easy task since Malta is in the unusual position of being a highly developed country in the social and cultural fields with a long-standing and sophisticated tradition of an educational structure; at the same time it is still an economically developing nation. This means that while the problems facing educational technology in Malta resemble those to be found in Glasgow, the economic position of the nation resembles more that of Samoa. While Malta can learn from experiments in both places, it can only do so with qualified restraint.

Again, the Maltese situation can be compared to other developing countries only to a limited extent. Its minute size and small population, its location in the Mediterranean as well as its history make Malta different from its neighbours. For example, although Malta is only 200 miles away from the North African coast, its people have very little kinship with the cultural, social, traditional and religious influences found in Libya, Tunisia and Algeria. The same applies to Malta's northern neighbours. Malta's traditional, religious and topographical features are very similar to those in Southern Italy, Southern France, Spain and Greece, yet Malta's close association with Britain during the last 170 years make its social and cultural ties resemble more those of a London suburb than neighbouring Sicily, 60 miles away.

Furthermore, Malta does not have the perennial problem of a shortage of teachers and school accommodation experienced by most developing countries. If anything, the educational system has an

abundance of both, factors that are now creating unforeseen problems of their own. While many developing countries are starting from scratch Malta's drive for improved educational opportunities is sometimes accelerated, sometimes restricted by long standing social, religious and cultural attitudes towards education.

This work is placed at a disadvantage by the lack of previous studies in the field of educational technology in Malta. Whenever possible reference is made to published works. For example, extensive use is made of the two recent Unesco reports by Lewis (1967) and Cameron (1970).<sup>2</sup> More often the author has to rely on his twelve years experience in the Department of Education. During this time he taught in various sectors and in different locations in Malta. For two years he was responsible for the promotion of educational media use and for the administration of the Ministry's Audio-Visual Aids Centre. During this time he visited nearly all the primary and most secondary schools, where he discussed the use of educational materials with nearly every Headteacher. At the same time he acquired valuable experiences through contacts as lecturer at the Mater Admirabilis and St. Michael's Colleges of Education, through close co-operation with the Schools Broadcasting Unit, with the Malta Broadcasting Authority and as a producer of children's television programmes for Malta Television, the local commercial broadcasting company.

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<sup>2</sup>Unesco educational planning consultants to the Maltese Ministry of Education.

During this period, this writer gained first-hand understanding into the problems faced by both the educational administration on one side, and the practitioners in the schools on the other. It was apparent that the Department of Education professes a favourable attitude towards educational technology but lacks a definite policy of implementation. Consequently the schools lack the guidelines, indeed they often lack the means to make educational technology a reality.

This dissertation brings together the author's experiences in Malta, his studies in this branch of education at the University of London Institute of Education, at Loyola College and Sir George Williams University in Montreal, and the information he gathered from visits to educational institutions in North America and Britain, in an attempt to overcome this deficiency by proposing an educational technology policy for Malta.

The dissertation is divided into three main sections. Part One established the rationale for an educational technology policy for Malta. The first chapter deals with the antecedents of change in Malta, and the prominent role that education played among them. It illustrates how improved educational opportunities coupled with improved social conditions, better communications, more intensive associations with foreign cultures and societies, have in turn heightened the social and educational expectations of the Maltese. The Maltese educational system which was structured to cater to an elitist group is slowly changing to meet the increasing demands of the population at large. However, it relies mainly on traditional approaches and has as yet failed to profit sufficiently from new developments in methodology, psychology and

technology which can help it reach its goals.

The second chapter elucidates on the attitudes towards educational technology in the Islands' educational circles; and proposes how these attitudes can be utilized or altered to assist the educational system benefit from an educational technology policy. The second part of this chapter expounds on the role of an educational technology policy in overcoming some of the economic impediments to educational development by helping the educational system derive the optimum benefits from the Islands' human and material resources.

The third chapter illustrates how the Maltese traditional attitudes to schooling have restricted attempts at educational innovations. Recent developments in the Maltese educational system should become strong assets in the acceptance of educational innovations. The manner in which an educational technology policy for Malta can utilize and at the same time enhance the benefits of these developments are discussed in the second part of this chapter.

Part Two elaborates on the role of an educational technology policy for Malta, by expounding on the foundations of Educational Technology. The fourth chapter defines the author's concept of Educational Technology as the systematic application of intellectual and mechanical techniques to solving educational problems. The fifth chapter applies the concepts of Educational Technology as developed in the previous chapter and proposes an educational technology policy for Malta. It proposes an alternative method by which the Maltese educational system can meet the demands for improved and extended educational opportunities. It delineates the reasons, and formulates

the assumptions inherent in the proposed policy.

The need for curriculum development and methodology reform through the systematic planning of instruction, and their role in an educational technology policy are discussed in the sixth chapter. The seventh chapter describes and discusses the application of educational materials. It elaborates on the role of educational materials (whether the traditional chalkboard or the latest electronic system) and their contribution to improved instruction when used within a technology of education. This chapter discusses also the possible misuse of educational materials, as well as the hazards of ignoring the effects that the mass media are having on the learner.

Part Three offers suggestions on how the proposed educational technology policy can be realized. The eighth chapter evinces the need for professionalism in education as an essential element for the success of the proposed policy. It makes recommendations on the structure of the two teacher-training courses in educational technology as a partial contribution to fulfilling this need. The ninth chapter argues for the necessity of an administrative framework that will implement the proposed educational technology policy. This chapter elaborates on the role of a Malta Educational Technology Centre which will<sup>3</sup> provide the direction,

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<sup>3</sup>It is appropriate to clarify the use of the verb "will" in this dissertation. The writer recognizes the hazards of prescribing future developments with finality. He has attempted to formulate a future educational technology policy for the Maltese educational system in the most constructive manner. He has attempted to be predictive without burdening the reader with statements that are repetitively preambled with a string of qualifiers. Whenever the occasion warrants, such elaborations are included; more frequently (for stylistic reasons) he writes "will" with the understanding that the reader recognizes that such predictions should be qualified by "probably", and "in this writer's opinion."

co-ordination and logistical support required to render such a policy effective. The last chapter suggests the implementation of the educational technology policy through the establishment of a Malta Educational Technology Centre; it proposes the Centre's rate of development and its administrative and functional organization.

The proposed educational technology policy for Malta combines the techniques of Educational Planning with those of Instructional Technology, so that Educational Technology becomes:

a field of study and practice within education concerned with the intentional and systematic organization of ideas, activities, and environments (through the application of cybernetics, systems theory, and other relevant knowledge and skills) to accomplish a specified and potentially reproducible educational outcome (Mitchell, 1971c, pp. 7-8).

PART ONE

THE RATIONALE FOR MALTA'S EDUCATIONAL  
TECHNOLOGY POLICY

## CHAPTER I

### NO PLACE IS AN ISLAND

Malta is an independent nation; its 320,000 inhabitants live on the archipelago of Malta, Gozo and Comino in the middle of the Mediterranean. Malta is often referred to as the Island Fortress, and is generally known for its role in the turbulent history of the Mediterranean. What many non-Maltese seem unaware of, and what some Maltese tend to forget, is the fact that Malta contains a living, evolving community, a society that has been changing and developing since pre-Phoenician times. This evolution has not ceased, and the forces of change that are shaping the rest of the world have not by-passed Malta. Indeed this change has come to the Islands with greater swiftness and more impact than in many other countries. Education has played a major role among the antecedents of change in Malta. These in turn are intensifying the Maltese expectations for improved and expanded educational opportunities.

#### Antecedents Of Change In Malta

Vastly improved communications within and outside the Islands, current mobility on and off Malta, tourism and emigration, economic and cultural exchanges, together with improved educational opportunities, and a new-found awareness of national pride through Independence are changing the inhabitants' traditional perspectives. Bowen-Jones et al (1960, pp. 179-183) point out that uniformity, homogeneity and openness to world



ideas are the social virtues lauded and inculcated in 20th Century Malta. Such observations are even more common now, eleven years later.

### The impact of World War II

The causes of change have been many and varied. Bowen-Jones et al. (1960), and Boissevain (1965), point out that many Maltese regard World War II as the dividing line between the old way of life and the beginning of the new. The unprecedented influx of allied personnel with divergent cultures, social behaviours and outlook could not fail to permeate the local population with whom they developed complex, and sometimes deep social interaction.<sup>1</sup> The effect spread throughout the Islands when, to escape the heavy enemy bombings, urban dwellers were evacuated to rural areas. This led to a new type of van-transport commercialism on a mobile-shop system which brought isolated communities into contact with outsiders and bearers of immediate news. The changing pattern of work, from the insecure and burdensome work in agriculture to new opportunities in wage labour, allowed time and opportunities for social and educational activities. These, too, helped break down further the social distance between urban and rural communities. Correspondence and visits from emigrated Maltese who described (sometimes in highly exaggerated terms)

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<sup>1</sup>Many British Service civilian personnel married into Maltese families and settled on the Islands. Atkinson (1969, p. 32) points out that the close association with the British armed forces and the common experience of resistance to enemy action has given the Maltese a genuine admiration of British institutions. The current, and past, financial disputes with Britain are outcomes of the Maltese' desire to build an affluent society based on British standards, an aim with which British residents on the Island sympathize.

the commodities and amenities taken for granted in their adopted country, further widened the horizons and heightened social expectations and the demands for a better way of life of their resident relatives.

### The mass media

The mass media made further contributions to the process of change. Rediffusion (wired sound broadcasting) and the cinema which flourished during the war continued to do so in the post-war years.<sup>2</sup> At the same time the local press increased in volume and scope from two dailies and two weeklies during the war to the present six dailies and seven major weeklies (Unesco 1969, p. 587, p. 593). Foreign newspapers and magazines, particularly British ones, enjoy increasing circulation.<sup>3</sup> The new awareness of foreign cultures and ways of life was heightened with the advent of television, first in 1957 through the reception of programmes from Italy, and two years later by the setting up of a local channel broadcasting programme of Maltese, British and American content. More recently the transistorized radio has spread the effect of sound radio by eliminating the constraints of fixed outlet points and the two channel limitations of the Rediffusion System. Broadcasting is

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<sup>2</sup>In 1968, the Cinema seating capacity in Malta was 97 seats per 1000 inhabitants, and the annual fee-paid attendance was 12 times per person. Comparable figures in the U.K. were 29 seats and 4 annual visits per person. (Unesco, 1969, p. 615).

<sup>3</sup>British and Italian national newspapers are on sale in Malta a few hours after they appear on the London and Rome newstands.

extremely popular and widespread.<sup>4</sup> While printed matter is considered to have developed a desire and an impetus for change mainly among Malta's literate section of the population, the cinema, radio and television had their greatest impact on the illiterate (Boissevain, 1965; Blouet, 1967).

One should point out that the language used by the mass media in Malta varies between Maltese and English with Maltese predominating. For example, the thirteen major newspapers, two dailies and one weekly are in English, the others are published in Maltese. On the other hand, the cinema is totally English, except for two or three theatres which present Continental films. Local television productions are in Maltese, while imported programmes are in English. Only rarely are foreign programmes "dubbed" in Maltese. The ratio between locally produced and imported programmes is roughly equal. Programmes from nearby Italy which can be received readily in Malta are, of course, in the Italian language. Local radio content is approximately fifty per cent English. Maltese and English are both the official languages of Malta, and both are used in the schools, in the courts, and in business life.

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<sup>4</sup>For example, in 1970 the Malta Broadcasting Authority issued or renewed 59,017 (48,577 of which were subscribers to two channel cable radio) radio receiving licences and 43,444 combined radio and television receiving licences. These figures, which do not account for holders of one-wave-band holders who do not require a licence, nor for households that have more than one receiving set, give a ratio of 31.80 radios and 13.48 television sets per hundred inhabitants. Comparable figures for Britain are 32.93 and 28.63, those for Italy are 23.07 and 16.76 and those for Greece are 11.74 and 1.43 respectively. (Malta Broadcasting Authority, 1970, p. 90).

### Tourist industry and Independence

During the last decade, two other factors have also contributed greatly to the process of change in Malta. These are the development of the tourist industry and the gaining of Independence. They are closely related because both came about on the initiative of the Maltese and for their success depended mainly on local people and resources rather than the financial or military backing of a colonial power.

The development of the tourist industry had a twofold impact on the local population. It is repeating and expanding the contacts with foreign cultures and life-styles first experienced during World War II. This is happening at a time when the Maltese, highly influenced by local and foreign mass media, are becoming increasingly receptive to, and tolerant of new ideas, and increasingly demand an affluent way of life. At the same time the rapidly expanding and highly profitable tourist industry is providing a measure of self-reliance which is spreading to the other sectors of industry. These feelings have been reinforced by the seven years of Independence which, contrary to colonial predictions are proving that the Maltese can rule themselves effectively. This awareness is providing the inhabitants with a degree of self-confidence and national pride greater than colonial days.<sup>5</sup> It is also making the Maltese self-critical, since they cannot shift failures onto the colonial administrators, a past tendency which lead Lord Stopler, in his 1964 report on the Malta economy, to remark

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<sup>5</sup>The recent clash over the rent of military bases to Britain is also a symptom of this growing national pride and self-confidence; as is the investment by the people in local commercial enterprises rather than the traditional practice of investing in foreign and presumably more stable economies.

about "the unwillingness to make decisions that will disturb the status quo, and the desire to have other parties make the necessary decisions and changes" (cf. Blouet, 1967, p. 234).

### Education

President Johnson's observation that education more than anything else moulds the citizens of a country, (1965, p. 5), applies equally to Malta. If a factor can be singled out as the main catalyst of change in Malta, it is the development of education. Boissevain explains:

Traditionally, age was an important determinant of status. Age meant wisdom, experience and position at the head of a large family. The deference accorded to age is preserved in the proverb "Heed well the world of the elders" [Kliem ix-xih zomm fih]. But in a society where teenage sons work as skilled labourers, clerks, and teachers while their fathers still farm or dig ditches, and where schoolboys read letters, newspapers and voting instructions to their illiterate parents, the words of the elders are often not heard. [In Malta] the social and cultural gap between the old and the young is wider now than it has ever been for many generations (1965, p. 52).

Bowen-Jones et al. reinforce this observation: "The chief contrast observable in the field is between the two age groups, over and under 30 to 35 years of age. The former still contains many illiterates and therefore conservative people; the other by reason of training as well as age is radical and impatient" (1960, p. 177). This observation is even more evident now, twelve years later, with a new generation containing many young people who attained secondary education which most of their parents lacked.

### Demands for Expanded Educational Opportunities

It is true to say that the Maltese are today more demanding and impatient for social, economic, political and religious changes than ever before. Most Maltese, particularly young parents, are impatient for, and insist upon improved and expanded educational opportunities for their children. This is not solely a Maltese phenomenon. As Beeby (1966), Coombs (1968) and Bereday (1969) illustrate at some length, such demands exist in the developed as well as the developing countries. However, the impact of such demands in Malta is greater than in some other countries due partly to the limited finance the State can expend for education; partly, to the small size of the Islands where even a modest cultural or social innovation has immediate effect on their small population; but mainly, to the fact that for centuries the Maltese educational system catered primarily to a social elite.

These three points need elaboration to comprehend fully Malta's educational planning and developing problems.

### The problems of an economically developing country

After centuries as an island-fortress, occupied by one foreign power after another, Malta became an independent nation in 1964. Not only did they begin ruling themselves but also the Maltese had to find new ways to financially support themselves as well. Until recently (when the British decided to cut down on their military commitments) as long as Malta was a military base, the livelihood of the inhabitants was assured. This was partly so under the British who relied on the active participation of the Maltese to operate the base.

Translated into an economic reality, this meant income from direct wages of Maltese servicemen, technicians, labourers and supporting personnel, as well as from ancillary services ranging from the provision of food-stuffs and dwellings, to taxis and liquor bars, and the indirect effect of these transactions on all sectors of the economy.

The more important the base became for British and Allied military strategy, the more the local inhabitants became involved and prosperous from it, and the more the other industries of the Islands became neglected. The better paid, less strenuous, relatively secure jobs at the drydocks, army depots and airfields attracted more and more people from agriculture, fishing and weaving. By the end of the British rule, local industries were almost extinct. Present attempts to revitalize the Islands' agriculture, fishing and smaller industries appear to be economically viable, but are still far from sufficient for local needs, still less for exportation.

The diversification from the naval to a general overhaul dockyard, the establishment of light industries, and the development of a tourist industry are steps toward making the Islands self-sufficient. Government expenditure in education had to be shared with this major diversification programme, as well as with the other social services. The diversification plan also makes direct demands on education funds since a major retraining programme is currently under way to fit redundant military and ancillary personnel into the new non-military industries. Lack of funds account for many of the inconsistencies found in the educational set-up, a factor which will be considered later as a possible impediment to an effective educational technology

policy.

Lack of funds does not totally exonerate the Department of Education from lack of better planning and allocation of its personnel and resources. For some time the Department has been aware of this and comprehensive steps, including the establishment of an Educational Planning Unit, are currently under way to streamline its functions.

#### Problems peculiar to Malta's size

Some of Malta's educational planning and development features are unique to the Islands because of their geographical position and size, as well as their historical role in the Mediterranean.

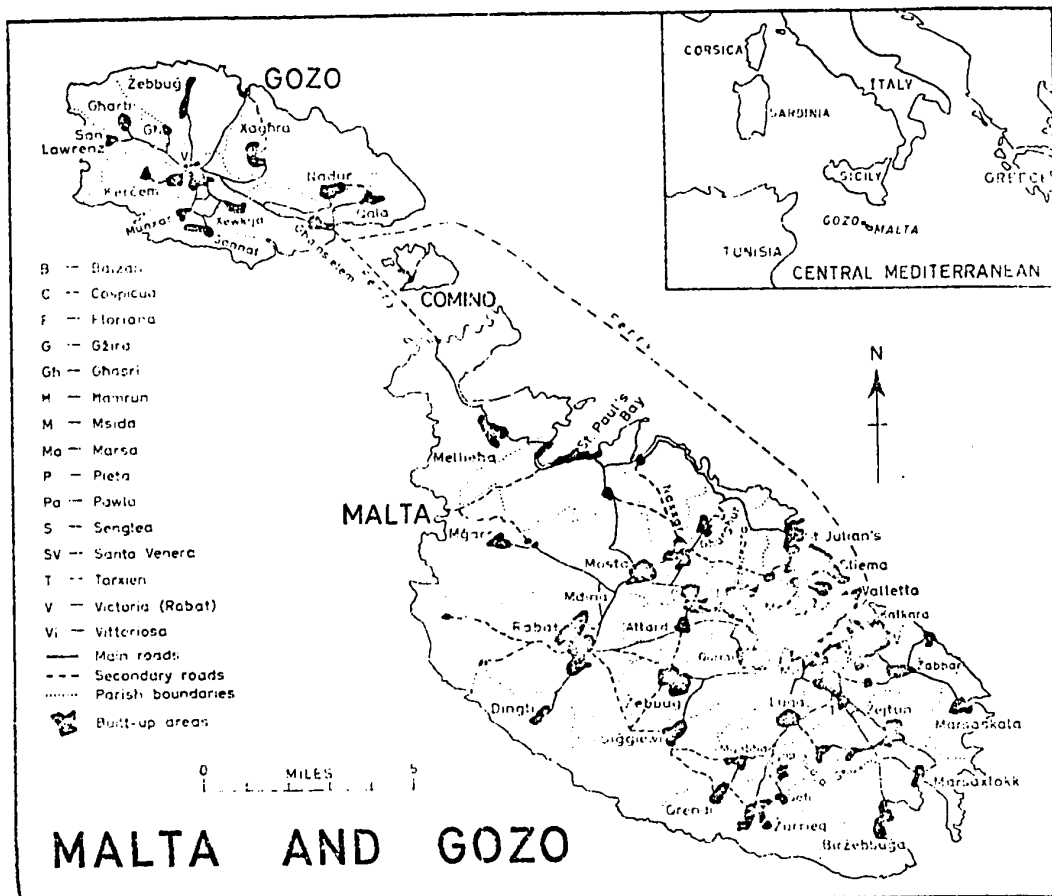
One third of a million people confined to just over 120 square miles of living space on two small islands (cf. Figure 1), the Maltese have seen invaders come and go from Phoenician times up to the present day, yet have maintained a highly individualistic and insular character, best manifested through their language spoken only by themselves.

Geographical and historical circumstances have evolved a closely integrated society held together by a wide net-work of personal and familial relationships. Lewis points out that Malta's social picture is reflected in its government which is far more personal and human than in larger countries (1967). There is no anonymous and impersonal Establishment centred in distant Washington, London or Paris (Cameron, 1970). Government ministers, members of parliament, and high ranking civil servants are easily recognized in the streets, their antecedents known; very probably some of them are relatives, or relatives of friends. In such circumstances the steady, impersonal implementation



FIGURE I

## MAP OF MALTA AND GOZO



## Notes:

Malta: land area, 122 square miles; population, 314,175; Mother tongue, Maltese; Official languages, Maltese and English. Malta is an independent nation within the Commonwealth. It is a member of the United Nations Organisation, the Council of Europe, and an associate member of the European Economic Community.

Occupational Class: Professional and Clerical: 15%; Service and Skilled: 55%; Semi- and un-skilled: 20%; Agricultural: 10%; Literacy: 87.5%.

Source: Hillary, Bro. Malta Year Book: 1970, Malta: St. Michael's College Publications, 1970.

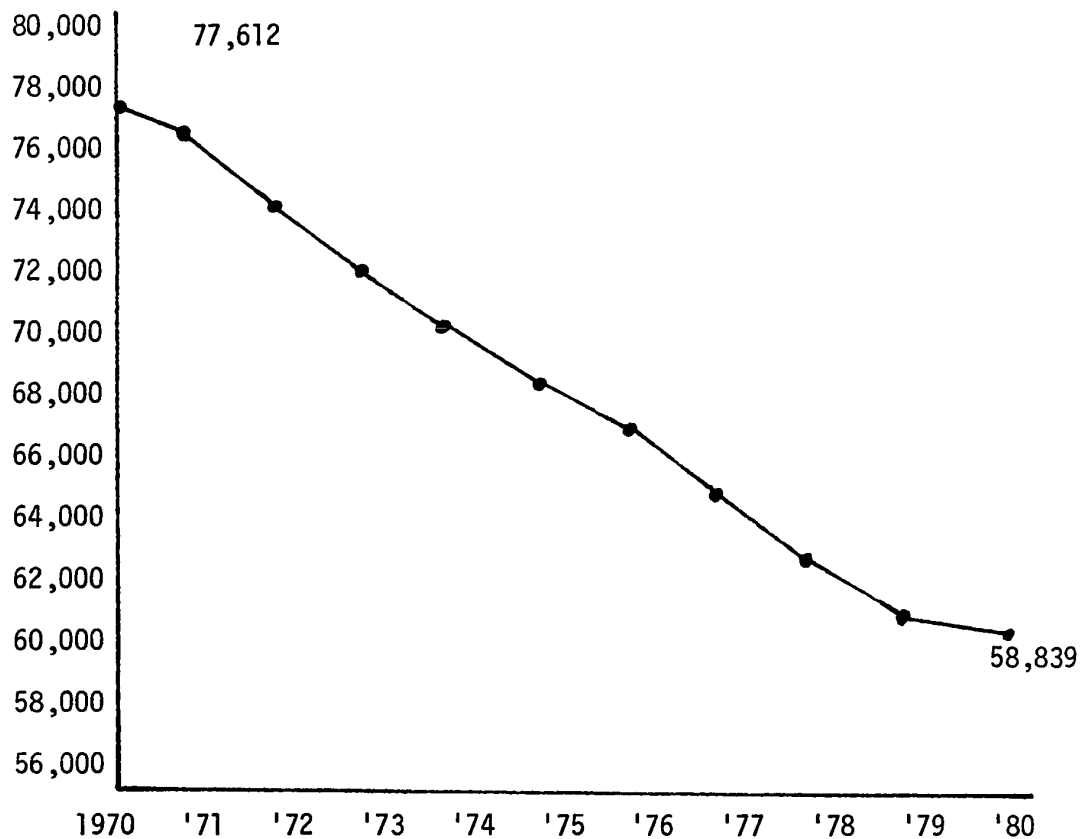
of a planned policy is difficult. A case in point is the reluctance of school authorities to prosecute parents whose children fail to attend classes regularly because their services are badly needed on the family farm. The training and recruitment of teachers in excess of the required quota, is another.

Malta is one of the few nations with a decreasing child population. This is caused by heavy emigration and a decline in the average size of the families that remain. For example, between 1960 and 1968 the number of children under the age of fourteen years dropped by twenty-two percent. It is estimated that by 1980, the number of children between five and sixteen years will decline by 18,500 (Cameron, 1970), as shown in Figure 2. In terms of educational planning this would mean that by 1980, at an average of twenty-five pupils per class over seven hundred fewer teachers will be needed, and that a considerable number of classrooms could be available for other purposes. Stated otherwise, if each teacher is put in charge of a class, the average class size will be thirteen pupils, a situation which, although desirable, may prove impossible for the educational system to support. Malta's declining birth rate demands planning opposite to that required in other developing countries.

The case of the seven hundred redundant teachers summarises well Malta's special constraints in tackling educational planning and development problems. Someone not familiar with the Malta situation may be tempted to suggest that the Ministry should stop training too many teachers; a logical suggestion under normal circumstances. In Malta, however, teaching is one of the few secure, civil service, pensionable,

FIGURE 2

POPULATION PROJECTION GRAPH FOR STUDENTS  
BETWEEN FIVE AND SIXTEEN YEARS OF AGE



Source: John Cammeron. Malta - Educational Planning.  
Malta: UNESCO/Malta Department of Education,  
1970, Appendixes I and II. (Cyclostyled).

Basis for projection: November 26, 1967 Census.

Note: Reductions due to death and emigration factors  
are not taken into consideration.

respected jobs among many insecure, non-pensionable, unwanted jobs. Many young persons and their families regard teaching as a compensatory reward after 15 years of schooling, particularly so if they are unable to obtain a university place and a job in the professions. In spite of the fact that it is equally dangerous to hire unnecessary personnel, the government will find it extremely difficult to take steps that will decrease the employment outlets in one of the most sought after jobs. It would be a psychological blow to the aspiring students, a financial blow to their families and a political folly to the Minister who takes such a decision.

#### Malta's Educational traditions

Like most European countries Malta has a long tradition of higher education; like most Southern European countries this education was available exclusively to the social elite. Thus Malta can boast a University established in 1561, supported by a Lyceum and Church-run primary schools (Vella, 1966, Lewis, 1967). Government schools were introduced in the late nineteenth century as in other industrialized nations. Yet, primary education became universal and compulsory only in 1946, and full-time<sup>6</sup> primary education in all schools became available in 1957.

The provision of secondary education was even less universal. For example, in 1955, due to lack of space, only eight percent of all primary school graduates were able to proceed to state-run secondary

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<sup>6</sup>Previously, primary education was provided on the 'half-time' basis, where some pupils attended school in the morning and the rest in the afternoon.

schools. These factors led to a highly selective system which encouraged an extremely competitive structure in a social system where pupils are streamed, and teacher and pupils are very conscious of examination results (Tuppen, 1969). In such a process good pedagogical practices are often sacrificed for the worst type of rote-learning exercises to provide pupils with a better chance of passing examinations and moving on to a higher level (Lewis, 1967, Tuppen, 1969, Cameron, 1970).

Attempts to provide a more liberal type of education have met with resistance, offered on the one hand by traditionalists who claim that educational standards will be lowered and, on the other, by anxious parents who fear that their children's chances of promotion and secondary education would be minimized. As long as secondary education was restricted to only a fraction of those who desired it, innovations--particularly those involving play methods, free classroom activities and the use of audio-visual aids which are associated more with the recreational rather than educational realm--were frowned upon by teachers, parents and students alike.

### The Educational System

Since the great upsurge of educational activity of the mid-1950's Malta has been trying to enhance educational opportunities so that anyone who desires secondary and higher education will be able to obtain it regardless of the person's social or financial status or age. As a result, free tuition Secondary Education for All Scheme became effective in 1970, and free-of-charge Higher Education (including University) for

All as recently as 1972.<sup>7</sup>

The educational system in Malta provides educational opportunities ranging from nursery school to the doctoral level. These are available through the public and private sectors. The former is financed by the State and administered by the Department of Education for the Ministry of Education, Culture and Sports. Private education is financed by private institutions, the payment of fees and in the case of some secondary schools, a small government subsidy. Private schools are mainly sponsored and administered by religious bodies; the Ministry has very little control over them, although negotiations are presently under way whereby the government will both provide greater financial support and assume more academic control.

#### Pre-primary

Approximately twenty percent of the children between the ages of three and five years attend such schools. These are run by religious agencies, who charge tuition, and are not controlled by the government.

#### Primary

Schooling is compulsory between the ages of six and fourteen, but if parents so wish, children are accepted in the Department of Education schools at five. Just over eighty per cent<sup>8</sup> of the children

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<sup>7</sup>See Appendix I Prominent Dates in Educational Development in Malta.

<sup>8</sup>These figures are taken from Central Office of Statistics, Educational Statistics 1967-68 Malta: D.O.I., 1970.

attend government schools, (which charge no fees and provide free text books). The remainder attend private schools.

### Secondary education

Until recently, the government provided three types of secondary education: (a) the grammar school which was derived from the Lyceum and the University whose structure was based on the academic traditions of Europe, (b) the secondary technical, and (c) technical which were based on British educational developments in this area of education (Lewis, 1967). In late 1971, the government replaced these three categories by the Comprehensive Education System to which pupils pass automatically from the fourth standard (6th grade) of the Primary school. The private schools are still mainly grammar schools. At the end of the fifth year of secondary level, students sit for the British General Certificate of Education at the Ordinary Level; and the Advanced Level if they take an extra two years of schooling at the Sixth Form Level.

### Higher education

This is provided by the Royal University of Malta, and the Malta College of Arts, Science and Technology and the two Colleges of Education. Tuition has been free except at the University; in 1972, tuition at the University became free as well. Though the University is financed by the Malta Government on an agreed triennial budget, it is completely autonomous in all other respects. The Malta College of Arts, Science and Technology and the two Colleges of Education are government financed and controlled.

Vocational and informal education

The Department of Education also provides a wide range of vocational, continuing, special and general education. These are free of charge, vary in length from three months to four years, and cater for a variety of subjects ranging from trades-training to cultural enrichment.

Thus one will notice that all public formal educational activities (except University education) are administered and controlled by the Department of Education, whose commitments now are for greater and more involved than when it was re-organized in the mid-1950's. As Cameron (1970, p.31) rightly points out, the greatly expanded educational system is placing a great strain on the educational set-up and its resources since the structure was devised for a small-scale system rather than the much larger and more dynamic system Malta has today. The Department of Education needs to reassess its present curricula, methods of teaching and learning, instructional environments, the utilization of human and mechanical resources to meet present and future needs. As Coombs, discussing what he termed a 'world educational crisis,' aptly stated in non-technical language:

No more than a grown man can suitably wear the clothes that fitted him as a child, can an educational system successfully resist the need to change itself when everything around is changing (1968, p.5).

This chapter has illustrated how Maltese society is caught up in rapid and dynamic change. The Maltese educational system has been attempting to keep up with this change. It has expanded its commitments and tried to satisfy the educational needs in all the various sectors



of the community, to the extent that its resources (as they are utilized) are taxed to the maximum. And yet, as it will be shown in subsequent chapters, the Maltese educational system has been unable to meet its commitments satisfactorily.

## CHAPTER II

### THE OPTIMAL UTILIZATION OF HUMAN AND MATERIAL RESOURCES TO MALTA'S EDUCATIONAL NEEDS

A major function of an educational technology policy will consist in helping the educational system, particularly the Department of Education, to make full use of, and to reap the maximum benefits from, the Islands' resources. Such resources should not be identified only with the obvious ones connected with education (such as teachers, students, school buildings and materials), but should encompass a wider view of the resources in the community, such as public halls, the mass-media, industry, and community goodwill. The last factor is of special significance to the success or failure of educational schemes or policies since the availability of the other resources, including finance, depend on the support such policies get from the community at large. In the past, the importance of this support has been demonstrated in the adoption or rejection of attempts at educational innovation in Malta. Four illustrations within the last decade come to mind.

The introduction of a third language --Italian or French-- in the fourth year (6th Grade) of the Primary School failed because the people, including many teachers, could not see the reason for it. Attempts in 1964-65 to alter the structure of the Secondary School Entrance Examination, although favoured by most teachers, had to be scrapped because parents felt (quite wrongly, in the opinion of

educational experts), that the proposed comprehensive examination instead of the customary English and Arithmetic tests would subject the candidates to additional stress. Similarly, because parents identify secondary education solely with Grammar Schooling, most of the Secondary Technical Schools have been compelled to reconstruct their syllabus. Now they have become virtually unrecognizable from the Grammar Schools; thus their original objective of providing secondary education with a technical bias has been lost. Yet another recent case was the establishment of the "new" Secondary Schools, which until the abolition of the Secondary School Entrance Examination and the replacement of the "old" Grammar and Secondary Technical Schools by truly Comprehensive type, were labelled "failure" schools, and assumed fourth choice to the established ones.<sup>1</sup>

Such incidents confirm Bauer's (1969) observation that in introducing innovations, great attention should be paid to the receiving population which, with its motives, desires and expectations, constitutes an active agent not a passive recipient of the innovation process. Klien (1969) goes beyond this, claiming that the receiving population, by accepting change and by participating in and contributing to it, can improve the quality of the innovation, and ultimately prepare the ground for a more basic commitment. Furthermore, Meierhency (1966, p. 460) argues that the acceptance of a novel idea is more rapid if the new idea takes into account the values of those with vested interests.

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<sup>1</sup>The Lyceum and Girls' Grammar Schools took first choice, followed by the Private Secondary, State-run Secondary Technical, and then the New Secondary Schools.

Confirming the above arguments, Coles (1969) points out that many attempts to introduce necessary educational reforms and innovations in developing countries were rejected by the population because the authorities had failed to explain sufficiently to the recipients the implications and the benefits of such innovations.

An educational technology policy for Malta will attempt both to gain the support of the community in order to avoid similar recurrences and to enable the educational system to reap the optimum benefits from available resources. Such attempts will have to deal with, and influence favourably, the attitudes of the community at large and the educators in particular. Once an educational technology policy has the support of the community, it will be easier to circumvent the two major barriers that are likely to impede its full effectiveness, namely economic impediments and the traditional attitude to schooling. This chapter attempts to diagnose those factors that influence the introduction of educational innovations, and offers suggestions on how an educational technology policy can result in the fuller utilization of previously hidden or underutilized resources.

### The Attitudes of Maltese Educators Towards Educational Technology

During his responsibility for the promotion of audio-visual media the author could discern a clear pattern of attitudes towards the use of educational technology.

#### Favourable and active

There are those educators who through experience, studies

abroad, or contacts with educational bodies overseas come closer to the concept of what educational technology might be, even though they may not label it by that name. They are the school inspectors, head-teachers and teachers-of-teachers who encourage the use of new pedagogies, new curricula and a flexible syllabus within flexible time-tables. This group includes teachers who are willing to experiment with new techniques and materials even though it involves additional work, who buy books and materials with their own money or who with their pupils, produce film-strips, class or school-newspapers, audiotapes, and learning kits in connection with centre-of-interest topics. Also included are those in educational broadcasting who attempt to co-ordinate their productions with educational needs, who provide the schools with materials and suggestions for activities that will enhance the educational effectiveness of the broadcasts.

An educational technology policy in Malta not only will support such people but also will seek their support, for this group comprises seasoned as well as influential educators. They would be among the first to contribute to the realization of an effective educational technology policy through active participation in research projects, in teacher-training, in the acquisition and allocation of materials, or in providing administrative support.

#### Favourable but inchoate

There are others, who again through training abroad,<sup>2</sup>

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<sup>2</sup>This should not imply that only those educators who have had the opportunity to study abroad tend to have favourable attitudes towards educational technology.

through improved teacher training with greater stress on courses in new methodology, curriculum and the use of educational materials, and through summer refresher courses, recognize the need for child-centred, play-activity methods, programmed instruction or the possibilities inherent in educational materials but have not yet developed the techniques of incorporating these activities into systematic instructional processes. This category of educators is further handicapped by often rigid timetables and terminal examinations pressures, as well as pressures from parents, and oft-times superiors, to "concentrate on the more important subjects" (i.e. to provide written exercises in English and Mathematics). Consequently such teachers tend to limit new methodology to such ancillary subjects as Geography and History, and use educational materials as a peripheral activity rather than as an integral part of the lesson. This becomes most evident with the use of films, filmstrips and educational broadcasting programmes; in the author's observations few attempts were made to integrate them into other classroom activities. The attitude of the traditional audio-visualists who value the use of educational materials for their discriminatory and descriptive properties (summed up in the assumption of "Tell them or show them, and they will learn") is very much evident in this group.

The educators in this group, however, are generally favourable to educational technology and are likely to be receptive to a policy that will enable them to use modern techniques and materials more effectively than in the past. An educational technology policy will have to nurture the favourable attitude of this group, as well as provide them with better in-service training and with better facilities to help them function at their best to implement the educational technology policy.

Unappreciative

The third category consists of educators who themselves were taught and trained by such methods as drill exercises, unnecessary memorization, exercises and onerous homework. The very notion of using new approaches is alien to them. They associate discovery and centre-of-interest methods with kindergarten instruction, programmed learning with Pavlov's dogs and Skinner's pigeons, and the use of educational materials (except books and the black-board) with entertainment. They display charts and posters in their classrooms because they are expected to; their students listen to educational broadcasts without any orientation or follow-up activities and with the clear indication that the period constitutes a break from their more "important" work. The author noted several instances where the students were involved in copying homework exercises while supposedly following the educational broadcasts.

Visits to such teachers' classroom reveal charts that are badly designed for educational effectiveness. Many charts are hung far too high for the children to examine clearly; and they remain on display longer than necessary. It is common to come across maps, diagrams, Central Office of Information and travel posters which have no relation to the syllabus, and which, in any case, are not utilized for formal or non-formal instruction. In such situations, pupil-made charts or collages rarely feature in classroom "displays". Consciously or unintentionally many teachers seem to display materials more to adorn the class and to please the Inspector than for their educational utility.

The third category of educators are most evident in the secondary schools. Due to their rigid and disciplinarian school

experiences, limited teacher training,<sup>3</sup> lack of in-service training, and a lack of ready made educational materials, together with the heavier pressure of promotional examinations, they are little motivated, or unable, to adopt new instructional methods.

An educational technology policy cannot ignore this category of educators. It will recognize the fact that the majority of these teachers are sincere and may be giving their optimum. An educational technology policy must make it possible for these teachers to become persuaded of the intrinsic value of educational technology, since they can make a valuable contribution to its advancement. As Macdonald (1970, Ch. 1) has shown, their generally high status, (assumed from long service and teaching the higher classes), is likely to have a more contaminating effect on other teachers' attitudes than teacher-training. Therefore, a policy of educational technology will aim to alter these teachers' attitudes and provide them with the training and expertise that will allow them to operate in a more efficient and effective manner than now prevails. This could be done by involving these teachers in group discussions, seminars, demonstration lessons and refresher courses, supported by the dissemination of information about experiments, research and results of the pragmatism of current methods, and opportunities to

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<sup>3</sup>According to Cameron (1970, p. 18), 20% of secondary school teachers are University graduates, few of whom have had formal teacher training, 30% are "Visiting" teachers, i.e. temporary Junior College graduates with no teacher training; the remaining 50% are former primary school teachers with teacher training who transferred to the secondary schools.



select, prepare and validate educational materials.<sup>4</sup>

The past ambiguous attitude  
of the Department of Education

The diverse attitudes characterised by the three categories of educators described above are in many ways a reflection of the obscure approach the Department of Education has taken towards educational technology. This is not surprising. As Campbell (1952) and Lloyd (1959) have shown, teachers tend to reflect strongly the attitudes of their administrative bodies. These observations are reinforced by studies both of educational administration (Travers, 1962), and of industrial management (Lawrence and Seiler, 1965). These clearly demonstrate that in hierarchical organizations attitudes of the administrators set both the pattern for reform or non-reform and the attitudes which those further down the line follow.

The official stand of the Department is unequivocally in favour of educational technology. The recent establishment of an Educational Planning Unit, the moral support the Department gives to the Colleges of Education for the pursual of new pedagogies, the scholarships it awards its personnel to study abroad or undertake local studies in new curricula and new pedagogy, and the recent establishment of a curriculum and textbook committee, are manifestations of a favourable attitude.

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<sup>4</sup>A more detailed discussion about this aspect of the educational technology policy will be covered in Chapter VIII "Towards a Profession of Education", and in Chapter IX, "The Role of an Educational Technology Centre".

Support appears also in its participation in school radio and television broadcasting. The Department's Handbook for Teachers in Primary Schools (Vassallo, 1962) contains numerous exhortations to use new techniques in teaching. Furthermore, the amount and quality of teacher-made charts and pupil-made items employed in child-centred instruction and discovery methods, feature as an important criterion in Student-teacher Practice evaluation. An impressive display of "aids" normally qualifies the student for consideration as a Distinction candidate. Similar criteria are applied in Confirmation<sup>5</sup> and Efficiency Bar<sup>6</sup> inspections, as well as in the Assistant Headteachers' and Headteachers' selection examinations. Furthermore, Departmental circulars regularly exhort teachers to make full use of educational broadcasts and those teachers who fail to comply, when detected are reprimanded.

At the same time, however, the 'A' and 'B' streams of Standard IV and Standard V, (grade Six and Seven) classes<sup>7</sup> which are the entry points into the Secondary Schools are given to 'experienced' teachers, meaning those teachers who through rote teaching drill their pupils in the English and Arithmetic exercises that are likely to show up in the

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<sup>5</sup>Confirmation into the Civil Service Regular Establishment after one year probation from certification.

<sup>6</sup>Qualifies a teacher with five years' service for promotion and annual increments.

<sup>7</sup>Officially streaming has been eliminated in Government Schools, in practice it still exists, with the 'A' and 'B' classes considered to contain the more advanced students.

Secondary Schools' Entrance Examination. Rarely are such classes given to teachers who employ modern methods, to recent graduates from the Colleges of Education who tend to favour a more liberal approach to education.

The impression gained from discussions with head-teachers, inspectors and other personnel in the higher echelons of the Department is that they lend support to the implementation of modern pedagogical methods. This makes it very difficult for the casual observer to reconcile the Department's favourable attitude towards the use of educational technology with such statements in the Lewis report where it deplores the inadequacy of the teaching equipment in the schools (Lewis, 1967, p. 24), or when it states:

The use of radio and television is completely inadequate in a situation where both media can contribute considerably to the enrichment of general education and the systematic study of subjects for which there is a shortage of qualified teachers (Lewis, 1967, p. 25).

The follow-up report to Lewis by Cameron is more specific on classroom facilities:

The textbook situation is parlous. Most of the school furniture is hopelessly out of date and needs to be replaced, and there is almost no classroom wall with boards on which to display visual aids. Even the chalkboards are generally too small. Modern methods cannot flourish in such surroundings (Cameron, 1970, p. 9).

### Evidence from the Educational Reports

A close study of the Department's Annual Reports and the references to the use of educational materials, for example, clearly illustrate the discrepancy between the hierarchy's professed support for this sector of educational technology and the actual performance

and facilities in the schools.

The first mention of an audio-visual activity in the Education Reports was made by Laferla, then Director of Education, in the 1934-35 report, where he expressed satisfaction that: "For the first time, floor lectures for the Secondary Schools were held in the form of visits to Museums" (1935, p. IV). He went on to suggest that teachers should make greater use of teaching aids.

The next reference follows eleven years later. Laferla's successor, Brennan, regretted that although Maltese children seemed to be greatly influenced by new teaching methods, these methods were not being sufficiently utilized. "It is pathetic", he wrote, "to see the faces of children, especially in the outlying districts, all lit up with joyful expectation at the announcement of a Visual Education show." He went on to regret that this situation could not be altered with just one visual aids unit in the Department (1948, p. IV).

In the following year 1946-47, Brennan stressed his desire for greater use of teaching aids by devoting a separate section of the Education Report to "Visual Education", basing his arguments on those prevalent at the time.

Under Brennan's directorship teaching techniques, hitherto unexperienced in Maltese government schools, were initiated. He encouraged child-centred activities, helped several schools to acquire opaque projectors, made arrangements for films to be borrowed from the London Central Office of Information, and started a circulation library of photographs and illustrations for educational use. To stress further

the importance of visual aids and his belief that their use should be regarded more seriously, he established a new post, that of Visual Education Officer. Through his efforts, the interest in Visual Education was extended beyond formal education for in the same year, the Board of Education set up a Sub-committee to establish film ratings covering admission to public cinemas (Brennan, 1948 pp. V-XIX).

It appears, however, that Brennan's enthusiasm failed to permeate to many other officials in the Department. For example, in the light of the foregoing, it is difficult to understand how no mention of instruction in the use of educational materials was made in the curriculum of the Teacher-Training College newly opened that same year. It is more difficult to understand how only £371 of the £500 voted that year for the Educational Film Service was spent, when only six schools had an opaque projector, only eight had filmstrip projectors, and none had any movie projectors (Brennan, 1949, pp. VI-VIII). The Reports do not give reasons for these inadequacies but a clear failure of communication and implementation of policy is suspect.

Such inconsistencies between stated or desired goals and actual performance are manifest through subsequent reports. For instance, Brennan's successor, Vassallo, in the single Report on the Department of Education for the six Scholastic Years 1948-54, writing in the Visual Education section stated that he was pleased to note that more pictures provided by the teachers themselves were used in teaching. He was proud to announce the creation of an Audio-Visual Aids Centre and of a School Broadcasting Unit, both intended to fulfill the need created by new teaching methods (Vassallo, 1955, p XX). Further reading in this report

reveals, however, that the film unit of the A.V. Centre made only an average of 24 school visits<sup>8</sup> per year. It also reveals that the function of the Broadcasting Unit was severely limited by lack of apparatus and insufficient<sup>9</sup> receiving sets in the schools.

The last formal mention of Visual Education was made in the 1955-56 Report when Vassallo was "pleased that the standards of the previous years had been maintained" (1958, p. 6) despite the fact that the smallest number of Educational Shows was registered that year, as shown in Figure 3.

#### Results of the ambiguous stand

The classic example described by Schramm et al. (1967a, p. 102) as the case where educational media projects flounder because those who supported the project moved to other responsibilities or retired from employment, has happened in Malta; by 1956 any official audio-visual activity and the Visual Aids Unit, for all practical purposes, ceased to function. For example, the 1956 and subsequent Education Reports ceased any mention of Visual Education, except for one standard sentence introduced in 1956 which stated that a primary school teacher was seconded to the Visual Aids Office to organize the loan and distribution of filmstrips to the schools. The last report (Gatt, 1970) published omitted even this sentence. What had started as an active and ambitious programme through the Visual Aids Centre, in just ten years, fizzled into

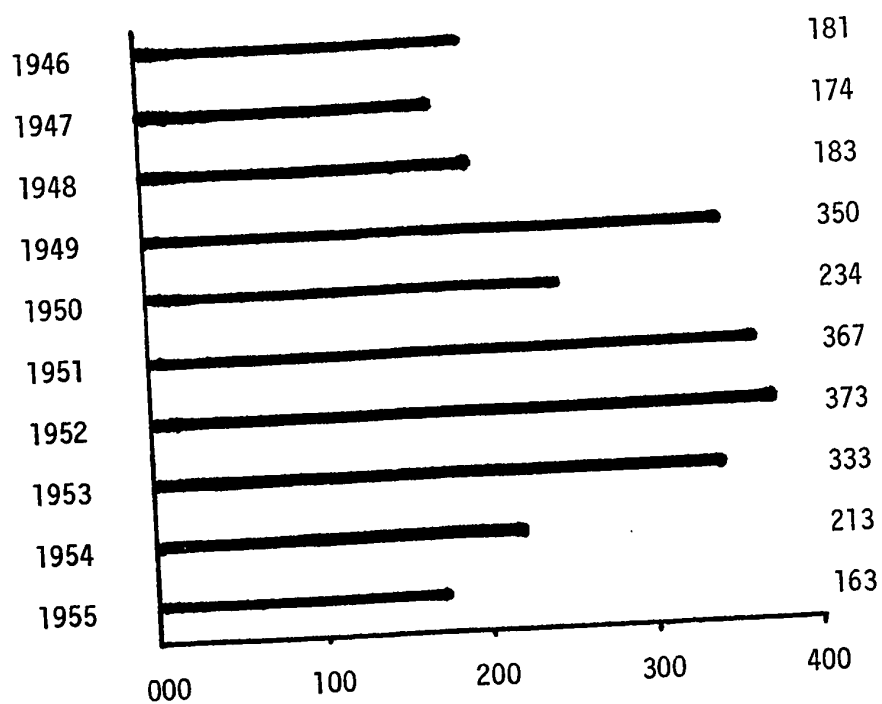
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<sup>8</sup>On a 'visit' the Unit projected films to several classes in the school.

<sup>9</sup>The Report does not provide actual figures or percentages; it simply states that many schools were unable to participate in the educational broadcasts due to the limited number of receiving sets (Vassallo, 1955, p. XX).

FIGURE 3

NUMBER OF EDUCATIONAL FILM SHOWS HELD IN  
STATE RUN SCHOOLS BETWEEN 1946-1955



Source: Department of Education Annual Reports  
from 1946 to 1955

near extinction.

Even the School Broadcasting Unit which has expanded in scope and activity, has passed from the hands of the Education Department to the Malta Broadcasting Authority, and the Department has no control over it except in an advisory capacity through the Schools Broadcasting Advisory Committee. This prevails in spite of the fact that until 1970 government schools were the only users of the Unit's productions.

Inconsistencies between the Department's goals and actual performance in the schools are greatly influenced by two major factors. Economic limitations, and Maltese traditional attitudes to schooling due to the highly competitive examinations-riddled educational system have been the major impediments to more effective educational innovations. An educational technology policy would need to remove these impediments as shown in the following sections.

### The Need for Educational Technology To Overcome Economic Impediments

Bowen-Jones et al. summarise Malta's financial difficulties comprehensively when they point out that:

Fear (of war), lack of security, the very factors that made Malta important as an outpost and earned her a George Cross are also responsible for many of her difficulties. Moreover, the changing circumstances of Mediterranean life with increased security have also deprived Malta of her most easily earned income (grants for use as a military base) (1960, p. 353).

As long as Malta was a military base, the livelihood of the inhabitants was relatively secure but dependent on the military power. The British



colonial administration did not encourage, in fact it discouraged industrial development; instead it preferred to pump large sums of money into the base so that the Islands remained financially dependent on the presence of the British forces. With Independence in 1964, the Maltese, besides ruling themselves, had to devise ways of supporting themselves as well. The diversification of the naval dockyards to an overhaul and repair commercial yard, the establishment of light industries and the development of a tourist industry are current attempts to make the Islands more self-sufficient. While most countries require developing aid to improve their social and economic status, the Maltese do so to maintain and improve, not relinquish the high standard of living the Garrison Years had gained them.

#### Educational demands and restricted funds

In the educational context, the demands for a high standard of living, mean that the Maltese expect the same kind of educational opportunities available in Britain. For example, Norman Atkinson, writing about Educational Construction in Malta (1969, p. 32), points out that while the Maltese have not sacrificed their own cultural traditions, they have relied heavily on the results of educational experiments in the United Kingdom, and have kept closely in step with British educational practices. The same can be said of the other social services. This situation leaves the Islands in the paradoxical position of having one of the highest standards of living in the Mediterranean Basin, and at the same time qualifying for aid as an industrially developing country which cannot easily afford all the social services that its inhabitants require. Besides attempting to

satisfy the ever increasing demands for improved and expanded educational opportunities, the State has to fulfill its obligations in the other areas of social services as well. It has to face what Pierre Rondiere (1970, p. 8) calls the difficult choice between either more schools and fewer hospitals, factories, fertilizers, roads and dams, or fewer schools than planned and more hospitals, factories, fertilizers, roads and dams.

Against this argument one must insert Harbison's point that:

the wealth of a country is dependent upon more than its natural resources and material capital; it is determined in significant degree by the knowledge, skills and motivation of its people.... Thus, investment in man and his development is fully as important as material invested in dams, roads, harbours, irrigation systems, factories or communications.... It is reasonable to conclude that the wealth of a nation is at least as dependent upon development of human resources as upon the accumulation of physical capital (1965, p. 71).

Malta has been forced to face these choices and satisfy the demands for social and economic improvements with often prohibitively restricted funds. Thus, one of the objectives of an educational technology policy is to bring out the optimal allocation of the human and material resources that are available to the Islands' educational system.

The Maltese Government devotes fifteen percent of its expenditures to education, the highest item on its budget. However, in actual monetary terms, the \$7.5 million spent on education in 1967, for example, was a meagre allotment among a population of 43,023 primary, 9,012 secondary and 2,371 higher-level education students. Out of this sum 65% was expended for personnel emoluments, the remainder for capital expenditures on school maintenance, free distribution of books, milk,

and medical services, as well as for educational materials for the schools. According to estimates by Lewis (1967, p. 8), only 60¢ per year for every primary school student remained for the purchase of library books, equipment, and other educational materials.<sup>10</sup> Thus while school buildings are spacious and well built, provisions for their upkeep are poor, and funds for textbooks, libraries and ancillary materials are virtually non-existent.

In spite of the fact that the government has been raising its educational budget every year,<sup>11</sup> it has been unable to develop education as planned (Cameron, 1970). For example, it has not developed educational television and radio to their fuller potential in formal education, and has not utilized these media to any extent in non-formal education. The Department of Education cannot provide teachers with sufficient in-service training, or any real monetary incentives to enable them to upgrade their qualifications.<sup>12</sup> Other areas greatly handicapped by lack of funds are facilities for research and development programmes, specialist staffing, curriculum development, and the

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<sup>10</sup>Malta's recently increased income from the rent of its military bases, and the government's renewed incentives for acquiring foreign aid, should become favourable factors in overcoming some of the more obvious impediments to educational development.

<sup>11</sup>£3,186,006 in 1966, £3,307,723 in 1967, and £3,571,943 in 1968 (Central Office of Statistics, 1968, p. 125).

<sup>12</sup>For example, the annual bonuses for degree holders are as follows: £25 (\$63) for a first degree, £50 (\$126) for a second degree, and £75 (\$189) for a Ph.D.

production of textbooks and educational materials designed for local educational requirements. Another unfortunate outcome of the lack of funds in the system is the "brain drain" of highly qualified personnel who, trained at the expense of the Department, are attracted by higher wages, better research facilities, and better chances of recognition outside the Islands.

#### Caution in educational innovations

This situation brings to mind Watson's point in "Resistance to Change" (1969, p. 450) when he quotes Paul Mort's assertion that desirable school innovations are most likely to be adopted by communities with high financial resources, since funds can be spared for such experimentation. Watson himself found that poverty has been a block to educational experimentation, with the result that Y.M.C.A.s located in communities with a low volume of retail sales per capita, were less likely to adapt recommended new practices than those in richer communities. Further, Wade (1967, pp. 96-98) indicates that an important factor which facilitated the Hagerstown expensive television experiments to introduce new instructional methods into a largely traditional system, was the prosperity of the area.

In the Maltese context the above partly explains why, while the people do want more and improved educational opportunities, they are cautious about adopting innovative educational approaches. On one hand, this caution has the beneficial outcome of weeding out and controlling schemes that are based on grandiose ideas with little practical value. Austerity also tends to produce resourcefulness and good educational

results from relatively low cost enterprises. The educational broadcasting service is a case in point. The 1970 Malta Broadcasting Authority Report (1970, p. 97) states that its 377 school sound broadcasts totally 114 hours aired during the scholastic year 1969-70 cost only £681, which in essence is only a very modest sum even though it excludes the salaries of the permanent staff working on the broadcasts.

A counter argument to that of limited funds and austerity tending to produce greater value for one's outlay, has been applied by Schramm et al. in The New Media: Memo to Educational Planners (1967a, Ch. 4) when they point out that restricted funds tend to restrain educational projects from reaching their full potential and their full pay-off point. They also point out that such projects have often been neglected or abandoned altogether on the basis that they did not fulfill their sponsors' expectations. In the author's view, (which is based on extensive discussions with educational broadcasters as well as with practicing teachers), educational broadcasting in Malta has failed to reach its full potential when one considers the amount of time and effort that is demanded for the production of programmes. This occurs precisely because lack of funds prohibit its fullest utilization. Thus while the on-air content is generally of good quality, its beneficial effect is greatly reduced at the reception end, when two classes are often grouped together with one radio outlet; or because the written supplementary material is so meagre that, its purpose becomes almost negligible. Similarly, due to lack of proper training teachers are unable to prepare the pupils for the broadcast, or to provide follow-up activities once it terminates.

A similar case can be made for the lack of effective Further and Adult Education programmes in the Islands. For example, Iley (1966), the I.L.O. consultant to the Malta government on the development of vocational training, reports that the Further and Non-formal Education programmes, impressive as they are in their diversity and quantity, lose much of their effectiveness because they are mainly sponsored by social clubs, religious societies, and philanthropic associations. These lack the professional competence, guidance and co-ordination which the Department of Education can provide at very little cost to itself because, although the Department lacks funds for capital expenditure, it has at its disposal other valuable assets in the form of qualified teachers and school buildings space in excess of what are required under the present arrangements.

An educational technology policy will attempt to reinforce through systematic analyses the present attempts of the Educational Planning Unit to obtain the optimum balance between the educational system's requirements and all the resources available. The recent successes of the Educational Planning Unit in this field, their implications on the educational system, and the role an educational technology policy can play in future projects, is discussed in greater detail in subsequent chapters. For the moment one need only stress the point that since funds for educational projects, as for all the other social services, are limited, the necessity of making the best use of what is available becomes imperative. An educational technology policy would therefore aim to achieve this goal and to avoid past difficulties such as Lewis describes:

There is some evidence that requests for funds for equipment are resisted by treasury officials whose views are coloured by the attitude that "we didn't have such things thirty years ago." Even when money is available and indents are made, clerical staff sometimes seem to adopt a "dog in the manger attitude" and do little to expedite the supply of materials to schools (1967, p. 2).

### CHAPTER III

#### OVERCOMING TRADITIONAL ATTITUDES TO SCHOOLING

The attitude expressed in the assertion that "we didn't have such things thirty years ago" typifies the major impediment to educational innovations in Malta, especially when these seem to challenge the established aspirations that people expect of the educational system they support. In order to achieve its objectives an educational technology policy must overcome this obstacle derived from antiquated concepts of education.

##### A Former Elitist System of Education

The Maltese regard education with the yardstick of their proverb "L-iskola tiwsa id-deheb" (Schooling leads to golden opportunities). Boissevain expands this further:

[In Malta] two important attributes of status are education and occupation. Education is the key that unlocks the world of the printed word and frees people from dependence on patrons willing to interpret it. Education also leads to better employment opportunities. Since entrance to the Civil Service, the professions and many commercial concerns is by competitive exam, the Maltese attach great importance to formal education (1965, p. 51)

For most students, especially those whose parents could not afford to provide them with private secondary education, good employment opportunities depended upon their success in the Secondary Schools Entrance Examination



leading to state-run, tuition free secondary education. The fact that until 1970 secondary education was not available to all who wought it (see Figure 4), and the knowledge that as recently as 1968, 69.3% of the candidates for the state-run secondary schools were rejected due to lack of space has overstressed the competitive aspect of formal examinations (see Figure 5). The competition heightens as the students advance along the educational strata towards University graduation.

University graduation implies a publicly acknowledged honour which guarantees recognition in the community, and a stepping stone towards a political future should one aspire to it. Today, it is still one of the high aspirations of upper and middle class families, to have one of their members graduate in the professions, ideally in medicine or the priesthood. Countless families are known to have experienced serious financial hardships, even sacrificed the educational opportunities of the remaining sons and daughters, to provide one son the opportunity of going through the Lyceum (until the 1950's the only public secondary school for boys), and the University. Similarly good educational principles and practices in the Primary and Secondary schools were, and are sacrificed in efforts to provide students with a greater chance of success in the General Certificate of Education examination (Malta Union of Teachers, 1969, p. 11).

In the lower stages of the educational process this may not be as obvious, although it exists. For example, Cameron describes Kindergarten schooling (totally privately owned and run) as follows:

FIGURE 4

SUMMARY OF SECONDARY SCHOOLS ENTRANCE  
EXAMINATION RESULTS, 1965-1968

<u>Year</u>	<u>Candidates</u>	<u>Successful</u>	<u>Unsuccessful</u>
1965	6,433	1,563	4,870 (75.7%)
1966	6,959	1,620	5,339 (76.7%)
1967	7,453	2,111	5,342 (71.7%)
1968	6,748	2,074	4,674 (69.3%)

Source: Department of Education Annual Reports  
1965-1968.

Note: The labels "Successful" and "Unsuccessful"  
are quite arbitrary for the criteria on  
which the number of "successful" candidates  
were selected depended on the number of  
places available in the State run Secondary  
Schools.

FIGURE 5

SUMMARY OF PUPILS REPEATING CLASSES IN  
STATE RUN INFANTS AND PRIMARY SCHOOLS,  
AT THE END OF THE SCHOLASTIC  
YEAR 1963-4

<u>MALTA</u>			
Sectors	No. of Pupils	No. of Repeaters	Percent of Repeaters
Infants	10,207	872	8.5
Primary	30,620	2,379	7.8
Both Sections	40,827	3,251	8.0
<u>GOZO</u>			
Infants	1,195	44	3.7
Primary	3,449	158	4.6
Both Sections	4,643	202	4.4

Source: L. J. Lewis. Malta Educational Planning Preparatory Mission). Paris: Unesco, 1967.

The term "nursery schools" is not applicable to any of them. ... the whole aim is to anticipate the teaching done in the primary schools by drilling the children in reading, writing and counting skills. In the way parents believe that their children will get a better educational start and so stand a better chance of success in the all-important secondary school entrance examination several years later. In effect, these schools are "crammers" for the primary schools (1970, p. 2).

The State run Infants and Primary Schools are attempting to move away from the unnecessary competition and the highly selective procedures typified by examinations. They are attempting to do this through child-centred instruction and discovery methods. Furthermore, attempts are made to extend these experiences to the higher levels. Unfortunately, however, even in the Primary schools, such efforts falter as students approach Standard IV and the Secondary Schools Entrance Examination. Even now that students pass automatically from the Primary to the Secondary level without any selection procedures, examination oriented instruction (with cramming, drill and rote learning) persist. Thus, many school experiences resemble those which Carl Rogers (1961, 1969) and Jerome Bruner (1963) have described as avoiding the promotion of significant learning and the development of intelligence. The following will explain further.

Tuppen in Educational Assessment in Schools (1969), a Unesco report on Malta, claims that the dominance of the Secondary Schools Entrance Examination has perverted the whole primary school system. He explains that although the primary school syllabus is comprehensive including cultural, creative and practical subjects, and although there is an introductory general note encouraging teachers to exercise initiative, the teaching is dominated by English and Arithmetic, the

two subjects valued by the examination. Because of the possibility of repeating the examination, the last two or three years of primary education, were subordinated to the examination instead of being used to prepare young people for entry into the adult world (Lewis, 1967).

John Holt's assertion (1964, 1967) that much of the American students' need to succeed in school is derived from the fear of failure, applies equally well to the Maltese situation. Fear of failure in the Secondary Schools Entrance Examination and the consequent failure to obtain a secondary education and a white-collar --and presumably a well-paid, respected job-- exerts great pressure on parents, pupils and teachers alike. It has given rise to an extensive system of private coaching for which the parents pay, it forces children to spend most of their school time in dreary mechanical repetitive "exercises" consisting of working through past examination papers (Cluff, 1971), together with innumerable hours in further "private" formal tutoring after school hours. It has created a superficial distinction between "adequate and inadequate" teachers based on the assumption that the "adequate" teachers are those whose pupils have the maximum successes in formal examinations. As Cameron puts it:

The whole primary course has been perverted to meet arbitrarily imposed and completely useless requirements (1970, p. 10).

Paul Goodman's arguments (1964) against "compulsory mis-education" and how such "educational" experiences lead to student alienation, can be applied very fittingly here.

### Resistance to new pedagogy

By the time they complete primary school those pupils who are successful in the secondary schools entrance examination become well moulded to comply with the secondary school mode of instruction. This is entirely lecture-type oriented, with the teacher lecturing and the students listening most of the time. Rarely do students and teachers, at this level, engage in enquiry and discovery methods. The students at the secondary level in fact, go through the same uninspiring educational experiences of their late primary schooling, only at this level they have to cope with eleven or twelve subjects instead of just English and Arithmetic. Furthermore, the stakes --and thus the pressure and fear on parents, students and teachers-- are heightened since the immediate prospects of a good job or university acceptance depend so much on one's performance in the General Certificate of Education or the Matriculation examinations. In effect, the secondary school learning experience of many students fits very well with Lucia Pearce's description of

The teacher-taught environment in its design and group-based instructional strategies encourages and awards physical and intellectual positivity, the ability to withstand boredom, to be directed ("motivated") from without, to team as a member of a group while being cut off from meaningful human interaction with others in the group, to be taught by a teacher from whom one is alienated during class time (1968).

Under these circumstances it is not infrequent to meet the student with an "A" Level in History who has never been to the National Museums or the prizewinner in Physics who has seen numerous experiments performed by his teacher but never actually handled the apparatus himself. The Secondary School drop-out average of 36% for boys and

23% for girls (Cameron, Appendix VIII) gives some indication of the students' dissatisfaction with their educational experiences, so that McLuhan's (1964, 1967) assertion that students find present schooling irrelevant and alienating, take tangible form.

Attempts to provide liberal experiences have met with resistance, on the one side by the traditionalists who claim that standards will be lowered, and on the other by anxious parents who fear that their children's chances for university admission or a white-collar job will be minimized. Coombs' (1968, p. 7) description of the social inertia in accepting educational innovations could be applied to Malta. This inertia, Coombs points out, results when many more people want additional education, but do not necessarily want the kind of education that, under new circumstances, is most likely to serve both their future best interest and the best interest of national growth and development. It manifests itself, he points out, in circumstances where the job preference, and therefore the type of education the people seek, are motivated by a prestige carrying a hierarch of jobs set in the past which does not fit the current manpower requirements.

#### Resistance to new curricula

These same causes described above, undercut the contribution of the Secondary-Technical Schools. These were established in the mid-1950's to provide secondary level education as an alternative to the grammar schools, the only type available till then. While the traditional type schools are highly regarded, the secondary-technical schools are viewed as second-rate institutions for second-rate students who, it is claimed,

are unable to obtain high enough grades in the Secondary Schools Entrance Examination. Constant attempts are made to make these schools resemble as much as possible the grammar schools, to the extent that one girls' secondary-technical school has an identical curriculum as a girls' grammar school (Cameron, 1970, p. 11).

One can argue that the above shortcoming deficiencies are not a Maltese phenomenon; the American education literature, for example, contains numerous reprehensions about similar experiences there. The kind of education available in most American schools had led Goodman (1964) to label it as "compulsory mis-education", Silberman (1970) has shown how it has led to what he calls the "crisis in the classroom". Wiener (1954) has explained how it shields students from reality, Friedenberg (1965) and Leonard (1968) argue that it punishes creativity and independence, while Postman and Weingarten (1969) refer to the present mode of schooling as the "subversive activity". All these writers, among others, have shown that for ethical, moral, social, political, economic, environmental and national reasons, the U.S. with all its vastness, riches and resources, cannot afford to tolerate this type of "mis-education". For the same justifiable reasons, only in a far more accute form because of its small size, lack of natural resources, and the close inter-relationships between the various sectors of the society, Malta cannot afford old fashioned educational concepts.

These concepts are playing havoc with any plans to fit the educational system to Malta's present and future needs. For instance, while the Islands' drive for industrialization sorely lacks technicians, the preference for grammar type to secondary-technical type education



has not diminished. At the same time the inordinate demand for the traditional degrees, particularly in medicine, theology, law and architecture, is causing disruption to the Island's economy and social structure. There are far too many doctors, pharmacists, dentists, lawyers and architects than the community can readily absorb, so that most of the new graduates in these areas have to emigrate. This is only one part of the problem. While Malta is experiencing a "brain drain" of highly qualified and skilled professionals it cannot afford to lose, at the same time, local industries are compelled to hire foreign technicians and scientists at much higher salaries than local personnel performing similar work. The first incongruity creates social discontent among graduates and their families, when the former are forced to emigrate to seek an equitable living overseas, after going through many personal financial hardships to see them through University. The second raises costs, and causes discontent among local employees who feel discriminated against by lower wages for performing equivalent duties as their foreign counterparts.

In the author's opinion, based on past experiences in this research in Malta, the most difficult obstacle to an effective educational technology policy will be to overcome the entrenched attitudes to schooling described above. The fear that change from traditional modes of instruction based on the theory of mental discipline, to those employing modern methods, will lessen the students' chances of success in formal examinations, acts as a powerful deterrent against educational innovations. Consequently such methods as enquiry and individualized instruction, and the "learning to learn" concept,

where the stress shifts from teaching to learning, from arbitrarily imposed objectives to student oriented centres-of-interest, are held suspect by many people. The above mentioned fear tends to be reinforced when extensive use of educational materials, particularly audio-visual aids, are employed, since these are equated more with the entertainment realm than with educational realities.

In the past, it was such attitudes that have hampered the attempts by educational administrators to introduce modern educational theories and methods in the classroom, as they did those teachers who attempted to carry out such methods. Even at present when the trend is moving away from the traditional atmosphere of Maltese life (see Introduction and Chapter I), those educators who employ modern methods risk the disapproval of some of their colleagues, some of their superiors, and other members of the community at large.

Recent Developments in the Educational  
System Favourable to Educational  
Innovations

It will be utterly incorrect, and unfair to the many educators in Malta who have been able to introduce improvements in the educational system, to create the impression that, due to economic restrictions and the people's leanings towards traditional educational concepts, the Maltese educational system has been stagnant. Furthermore, as far as an educational technology policy is concerned, this would also be a dangerous assumption since it would be ignoring recent developments that not only have had serious implications on the above mentioned impediments to

innovation, but can also have great relevance to the promotion of educational technology.

The two recent developments that should produce a radical transformation in the Maltese educational system and increase the need for an educational technology policy are (a) the introduction of the "Secondary Education For All" Scheme and the abolition of the Secondary School Entrance Examination; and (b) the reorganization of the Education Department and its resources.

### Secondary education for all

Free secondary school for all students who complete the fourth year of primary education came into effect in 1970. While this provision did satisfy the ever increasing demand for secondary education it did not eliminate the pressures exerted by the Secondary School Entrance Examination and their ruinous effect on the primary school system. This examination had remained the criterion whereby a pupil was chosen to attend the "old" grammar type, or "new" comprehensive schools. Since tradition, experience and reputation weighed heavily in favour of the former, the customary pressures for the highest marks possible were retained. Before the "new" schools opened, they were labelled as failure schools, despite the fact that these schools could prepare their students for entry to university.

The deficiency was rectified in late 1971 with the complete reorganization of the secondary schools system eliminating the distinction between "old" and "new", grammar and comprehensive schools, and the complete abolition of the Secondary Schools Entrance Examination.

This major break from tradition has three implications. From the social, cultural and political aspect it proves the Maltese preparedness and desire to accept educational change benefitting all sections of the population. Secondly, it reflects the emerging influence of a new type of internationally trained, liberal and highly competent administrators, striving for an educational system compatible with Malta's social and economic requirements. In pedagogical terms, the removal of the Secondary Schools Entrance Examination should enable schools to take Peters' advice and "consider the interest of the children and what is in their interest and have regard also for the public interest" (1966, p. 167). Pupils should now be able to proceed through school without being subjected to the strain of annual promotional examinations and the fear of being left behind as a result of failing them. As Cameron points out:

The awful bogey of fierce, competitive selection to a small number of secondary school places will disappear and the primary schools will become much happier, more spontaneous and more efficient institutions (Appendix IX, 2c).

Such institutions should be more receptive and conducive to educational technology.

#### The reorganization of the school system

The introduction of the Secondary Education for All scheme could not have been accomplished without the streamlining of the school system. This reorganization will release some 550 out of the 1800 serving primary school teachers for redeployment in the new secondary schools (Cameron, 1970). The regrouping of the smaller schools and the shortening of the primary educational programme reduced the number of primary schools from 111 to 87; thus releasing space for the new

secondary schools without having to build new premises, and at the same time providing space in the primary schools for activities other than the conventional classroom instruction. Furthermore, due to the Islands' diminishing Primary School student population (see Figure 6), the Department has found itself with a number of redundant teachers. Even with the extension of the Secondary Education for All, the proposed raising of the compulsory school age from fourteen to sixteen years, and an average of twenty-five pupils per class, the teacher surplus was estimated to exceed the seven hundred mark<sup>1</sup> by 1980 (Cameron, 1970, Appendix IX, 1b). The resulting reorganization has released resources which, together with the relaxed atmosphere in the schools, can have far reaching implications on the effective development of educational technology in Malta.

Having identified the major cause of resistance to educational change in Malta, and the recent developments in the educational system, how can an educational technology policy help overcome these problems and utilize the assets to benefit the community?

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<sup>1</sup>This number will be reduced by some two hundred teachers since the introduction of a three-year training course in 1971 will reduce the annual number of graduating student-teachers by a third.

FIGURE 6

THE DECLINE IN PRIMARY SCHOOL ENROLMENTS BETWEEN  
1962 AND 1968 DUE TO THE GENERAL DECLINE  
IN THE MALTESE ISLANDS POPULATION

Year	Total	In State Run Schools
1962	60,426	50,130
1963	59,557	49,187
1964	57,192	47,807
1965	55,364	45,470
1966	53,883	44,088
1967	53,456	43,887
1968	52,585	43,028

Source: Central Office of Statistics. Educational Statistics 1967-68. Malta: Department of Information, 1970.

An Educational Technology Policy  
To Overcome Attitudinal and  
Economic Impediments

Utilizing the available resources to the best advantage

Undoubtedly the reorganization of the educational system will enable it to utilize its resources more efficiently. However, it cannot be assumed that these resources will be sufficient to cope with the demands of a rapidly expanding education. Educational planning studies (Harbison and Myers, 1964; Coombs, 1968; Bereday, 1969; Illich, 1970) clearly show that once demands for one type of education are satisfied, people clammer for improved educational opportunities at a higher level. In Malta's case this will mean that once the "Secondary Education For All" Scheme becomes fully operative, the Department of Education will have to resume planning how it can expand Higher Education opportunities for greater numbers of high school graduates, as well as provide better facilities for Vocational and Further Education. These developments will exert extra pressures on the already overtaxed monetary resources of the Department; for although the school system reorganization released valuable resources in the form of surplus teachers and surplus school space, these cannot be translated into monetary gains since the government has committed itself to employing the redundant teachers and is unlikely to dispose of school buildings. In any case it can be strongly argued that these resources --particularly the trained teachers-- once available, are more valuable assets than material resources (Harbison, 1965). However, with the increase of educational opportunities, there will be an increase in the cost of providing them, through

higher salaries for teachers and an administrative personnel, and higher cost for the maintenance of schools and equipment. Therefore, it appears that the Department will soon be faced with two alternatives, on the one hand to continue struggling with its limited or committed resources to provide more of the existing pattern of education, or on the other, to look for ways of utilizing the resources it has available now, to provide a different kind of educational opportunities from the conventional (Illich, 1970; Mitchell, 1971).

#### A radical solution to providing educational opportunities

Many other countries were faced with a similar choice, and opted for the latter, selecting a solution that fitted best their particular problems and circumstances. For example, Japan, faced with the need to expand secondary education to its widely scattered island communities, developed the educational broadcasting and correspondence schools (Isao, 1964; Takeo, et al., 1962); for similar reasons Australia chose the radio schools (Kinane, 1967); again for similar reasons Italy established Telescuola, and the "It's Never Too Late" programme to overcome adult literacy (Tovaglia, 1961). Bavaria, unable to cope with the great demands for vocational and further education through the traditional instructional methods, launched Telekolleg (Schardts et al., 1970); while the U.S.A. developed Sesame Street, for pre-school children (Ball and Bogatz, 1970), and Britain, the Open University, for higher education (Pentz, 1969). The U.S.S.R. has developed the use of educational broadcasting to overcome its rapidly expanding demands for Lifelong Education in all sectors of the community, ranging from doctors to farmers (Tebbel, 1972). It is not suggested that Malta should



imitate any of the above schemes which basically depend on educational broadcasting for a wide audience, and correspondance tuition; indeed, due to Malta's peculiar circumstances, none of these schemes as they now stand would seem to fit the Islands' needs. The point is that the educational authorities in these countries searched for and found solutions outside the traditional pattern of schooling to solve their problems.

Thus far, the Maltese educational system has attempted to solve its problems through the reorganization of the school system, through regrouping and re-allocating its resources in order to reap fuller utilization, it appears that so far the desired effects have been achieved since in the past, so many resources were underutilized; but it is doubtful whether these resources will be able to satisfy future needs especially as the country's economic diversification continue to expand and as the need for Continuing Education or Education Permanente becomes crucial.

It will be the policy of an educational technology programme to help the department look for ways of improving the present organizational system, but it would also attempt to find ways of introducing solutions that are presently not embodied in the system. It will look into the development of procedures that encourage self-instructional methods: the establishment of self-improvement clubs where people with varying level of expertise can teach others, while they themselves will learn from their "pupils" who are experts in other areas. Ways will be sought to make a more efficient use of other mass media, which would include the use of relatively cheap and

widely available newsprint and the newspaper medium, as well as a more widespread use of radio and television. It will look into the possibility of developing school schedules that vary from the traditional eight to four, Monday to Friday, September to June scholastic year. It will seek the development of instructional practices away from the conventional classroom --particularly in vocational and adult education-- to the factory, to the construction site, to the village parish hall, to private homes where a group of housewives can gather, and to the farm. Based on self-help concepts, such schemes need not demand additional expense of the Department, rather they will depend on its co-ordination and guidance.

#### Co-ordination and guidance

The co-ordination and guidance of the Department of Education becomes crucial since without it, such schemes will be no different from the many private philanthropic adult education programmes currently in effect. The Department of Education can provide the services without extra cost to itself by utilizing the number of surplus teachers and extra school space it now has available. Since the Government is committed to retain the redundant teachers, this surplus creates an opportunity for their retraining in new pedagogies for the conventional classroom as well as the new educational schemes. It can lead to a situation where teachers are released from their classroom duties to pursue refresher courses, special subject courses, training in extra curriculum activities, and in running the non-formal instructional schemes mentioned above. Those teachers, who already have special interests and competence in particular fields, can be

encouraged and helped to participate in educational areas which are presently short of personnel.

The surplus space in the schools can be utilized to establish resource centres, centre-of-interest areas, experimental instructional laboratories, and educational materials production areas which teachers, students, and the populace at large, would be able to use according to their requirements.

Such schemes will require some funds for the purchase of equipment and materials. Some of these funds could be provided by the Department, the users could pay for some materials, while other materials could be obtained without cost through industry, which (as the author experienced while establishing the Audio-Visual Aids Centre), would be willing to assist in worthwhile educational projects. Another powerful source of assistance in overcoming financial restrictions can be found in the emerging parent-teachers associations. They can not only provide and collect funds for materials and equipment, but also, and perhaps more important, will have members whose skills and expertise would become available without cost to the schools.

At first glance the above mentioned activities might appear to be the sole concern of the Educational Planning Unit and beyond the scope of an educational technology policy. However, a closer look will show that the effectiveness of these activities will be greatly enhanced by the application of the "intellectual" and "mechanical" techniques that educational technology can provide. Thus while the Educational Planning Unit will be concerned with the overall organizational aspects

of selecting educational topics and areas that need looking into, of defining specific educational objectives, and of providing and allocating resources, an educational technology programme would provide the systematic analysis to set up experimental programme, to operate, evaluate and reconstruct them for maximum effectiveness. In Mitchell's words this work will be done by:

the educational systems developer...who besides studying the existing system... would study the metasystem and serve as a consultant to the educational planner functioning in a more comprehensive, national context to help orchestrate the functioning of component sub-systems (1971c, p. 9),

or, as Eriksson put it, by the Educational Technologist whose job is:

to translate social goals, principles, and dimensions of the educational enterprise developed by the Educational Planner into changes in the learning behaviour of individuals through instructional settings and processes (1969, p. 62).

Thus an educational technology policy would aim at enhancing the effectiveness of the present educational institutions as well as seek for improved, even if somewhat radical, modes or providing educational opportunities, including self-instruction.

#### The Need To Alter Attitudes

#### To Favour Educational Technology

No educational technology policy will come to fruition unless it has public support: this support will be granted only when the public can comprehend and appreciate the value of the innovations.

In implementing an educational technology policy the Department must publicize its intention and activities, provide details and offer

explanations for its decisions. Such promotional work is essential because the people have direct and profound interest in their education and therefore deserve to be aware of what educational innovations will involve.

Once convinced that educational technology can improve educational standards, the people can become vital allies in facilitating new projects and innovations. Firstly, their influence will effect government policy, which is always more inclined to finance and promote popular projects rather than unpopular ones. Secondly, the community can provide material help which the government, due to its other commitments, might find difficult to provide. It is suggested that P.T.A.s can make a valuable contribution to the provision or construction of educational materials. Such work in Malta has already been highly successful in the private school system where equipment, educational materials, even buildings have become available through private voluntary donations and effort. Perhaps the response in State-run schools might not be so forthcoming at first due to the notion, very strong in Malta, that the government should provide all that is necessary in its schools, (a notion that the government itself has tended to promote by prohibiting its schools from soliciting their own funds). However, the government has recently reviewed its position on this matter, and an educational technology policy would need to utilize this development, not only for its material benefits, but also, and in the long run more significantly, as a means of getting the community directly and actively involved in new educational undertakings. This latter aspect of an educational technology policy, namely, efforts

to overcome resistance to educational innovations, takes special significance in dealing with teachers' attitudes. Schramm et al., (1967a, p. 96), for example, singled such involvement as a major pre-requisite to the successful introduction of new media in education. It would be the policy of an educational technology policy, therefore, to enlist the teachers' assistance in every feasible way. This would serve not only as a means of gaining their support and utilizing their expertise but would also serve as an indirect way of orientating and training them in educational technology applications.

Consequently, as a first step in substituting ingrained attitudes towards schooling --now that the Secondary Schools Entrance Examination has been removed as the major obstacle-- would be to enlist in every possible way the involvement of the public in general, and teachers in particular, in new educational programmes. Secondly, it would be the aim of an educational technology programme to prove, through empirically derived results, that new learning methods are more effective and more efficient than the old teaching procedures. Macdonald has argued that one cannot legislate for or enforce educational innovations, that innovations accepted and effective in a society will need to be legitimized by it (1970). An educational technology programme will have high priority on developing ways of speeding up the legitimization of worthwhile educational projects, since the availability of the resources needed by the policy would only become available once the community's goodwill has been gained.

There is doubt that Malta's impediments to educational innovations, and consequently to the implementation of an educational technology policy

are formidable but they are not insurmountable. To quote further from Macdonald about the capacity of society to cope with the demand made on it:

... there can be no denying its [society's] remarkable implementing capacity, nor its access to a tremendous fund of intellectual resources [emphasis inserted] that can be drawn on for an attack on any problem that is officially identified as urgently in need of solution (1970, p 64).

In the same vein the former Secretary General of the United Nations, U Thant has said:

It is no longer resources that limit decisions.  
It is the decision that makes the resources. This is the fundamental revolutionary change - perhaps the most revolutionary man has ever known (1965, p. 184).

An educational technology policy for Malta would aim at this revolutionary change by utilizing the intellectual and mechanical technologies available to education so that the right decisions can be reached to render the optimum utilization of resources.

Educational Technology can become an effective agent in helping educational systems meet efficiently the demands made on them; an educational technology policy for Malta will assist the Maltese educational system to improve the quality and quantity of educational opportunities in the Islands. Educational Technology will help the Maltese educational system to review its traditional role and objectives which may now be based on outdated needs; to reassess its instructional methods; to consider the validity of using educational resources inefficiently when more reliable methods and materials are readily available. The following chapters set forth the nature and function of

Educational Technology which can invigorate education in Malta.



PART TWO

THE FOUNDATIONS OF AN  
EDUCATIONAL TECHNOLOGY POLICY

## CHAPTER IV

### THE NATURE OF EDUCATIONAL TECHNOLOGY

#### What is Educational Technology?

Mitchell points out that there is not an analytically precise concept of 'educational technology'. Rather it is "a vague term which refers to a confusing variety of concepts and activities related to the work of virtually all educators and many non-educators" (1972b. p. 1). The confusion is not lessened, perhaps is caused, by the fact that while many educators do not agree on the meaning of 'education',<sup>1</sup> the majority do not seem to agree on the real meaning of 'technology' (Heinich, 1968 ; Hoban, 1968; Silverman 1968; Ofiesh, 1970;).

Komoski offers one definition of technology as "any man-made device, process or logical technique designed to systematically produce a reproducible effect" (1969, p. 74). He bases this definition on the Greek root where technologia (techne = art, craft; and logia = systematic study)

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<sup>1</sup>For the purpose of this discussion, 'education' will be considered in its restricted meaning of formal and organized education related activities such as teaching, learning, curriculum development, educational materials, school organization and educational planning, in contrast to the wider meaning of 'education' which can be achieved away from the formal instructional process.

... had to do with techniques for logically arranging things, activities or functions in a way that could be systematically observed, understood and transmitted; and hence reproduced in the absence of the person who had first done the arranging. Sometimes, such arranging or logical ordering had to do with a way of doing things --a process, but most often it took the tangible form of a mechanical device-- a machine (1969, p. 74).

From the above description one concludes that the products of a mass-production concern, for example, are the outcome of two types of technology: intellectual technology which organizes the process and sets up the structure so that production can be carried with predictable results; and mechanical technology which executes the actual reproduction of the artifacts. Since the mechanical type is more manifest than the intellectual, the term 'technology' has become increasingly associated more with machines and less with intellect. In education, this point is explained by Heinich's observation that:

Educators tend to identify technology simply by its obvious manifestations; machines. It is an easy step from this to the simplistic view that if we have machines, we are using technology, and if we haven't machines, we are not engaged in a technological process (1968, p. 4).

This notion, prevalent among many educators, has distorted the real significance of educational technology to the extent that the mention of the term tends to create visions of large and sophisticated machines supported by expensive and highly complex organizations, which will serve the panacea of educational ills. Another mechanistic and extreme view is taken by critics who regard educational technology as an inhuman, mechanical placebo that falls far short of what the misguided technology enthusiasts claim it can do for education. Consequently, as Chu and Schramm (1967) conclude in their assessment of the research in

instructional television, too much attention, time and expense have been devoted to prove simply that educational materials teach as well as the conventional classroom teacher, rather than to develop ways of utilizing educational materials to their optimal educational advantages.

Such misunderstandings about the full scope of educational technology emerge as one reason for its misapplication; Mitchell (1970) provides another when he suggests that educational technology is perceived as a panacea and functions as a placebo because it has been confined to the application of non-educational technology to education rather than within a technology of education. This becomes evident when system analysis, performance contracting, contingency planning, the use of photography, radio, television and computers, are simply borrowed from the commercial and entertainment realms and applied in education with little or no adaptation to educational requirements. Similarly, classroom lectures of questionable value are broadcast or put on film and labelled "educational technology".

Directions for differentiating between the proper application and the misapplication of educational technology have been provided by Komoski when he distinguishes between:

The broad, pervasive historical impact of what may be called "the world-making technologies" of industry, agriculture and the health sciences on education; the narrower impact of the application of existing technologies (devices and processes) to education; and the still largely unrealized impact of a growing indigenous or intrinsic technology (based on a scientific knowledge of human learning within education (1969, p. 71).

An educational technology policy for Malta must differentiate between the three types and select those that will render the best possible

educational results.

### The Impact of Technologies ON Education

Alvin Toffler explains how technology feeds on itself, in the sense that technological innovations lead to a further acceleration of more technological innovations. He goes on to explain that technological innovations do not merely combine and recombine machines and techniques:

Important new machines do more than suggest or compel changes in other machines --they suggest novel solutions to social, philosophical, even personal problems (1970, p. 29).

Thus, besides introducing new mechanical devices such as television systems, computer terminals, low-priced paper-back books and photocopying equipment into the educational systems, technology has compelled educational systems to examine more closely their function and role related to the changing job requirements which new technologies are causing. The effect of technologies on education is far-reaching.

#### On educational equipment

The impact of technology on education is most evident in the quantity and quality of apparatus available in the schools. Improvements in design, easier operation and relatively cheaper costs of film, video and audio recording equipment, photocopying machines, as well as in the more expensive language laboratory, television, and computer systems, have encouraged many educational systems to invest heavily in apparatus. Improvements in this apparatus enable both teachers and pupils of amateur capabilities to produce educational materials of high technical quality, a factor that has encouraged people to use apparatus when only a few

years ago they would have been loath to do do.

#### On traditional school environment

A different kind of impact is provided by the technology that facilitates self-instruction. The development of resource centres, information retrieval systems, programmed instruction machines, radio and television broadcasting, programmed as well as ordinary books and instructional packages<sup>2</sup> frees the student from dependence on the teacher in the classroom, and allows him to pursue his own interest, at his own pace through self instruction. The new technology, points out Kurland (1968), has brought closer the possibility of realizing many educators' long desired objective of having the best teachers do for every pupil what previously they could do only for a few.

Technology has enabled educational systems to discard their traditional fixed time tables. The eight-thirty to four school-day, Monday to Friday school week, and September to July school-year, need no longer be rigidly maintained. Similarly, the idea that the period of formal school attendance should begin at five years and end round the age of twenty is being abandoned for the now possible, and necessary 'lifelong' education.

#### On traditional attitude to schooling

The effects of mechanical and intellectual technology on society at large are having a direct influence on the classroom. The pupil

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<sup>2</sup>The education value of these depends on the quality of their 'intellectual' techniques (i.e. their organization) as well as their technical quality.

exposed to mass transportation, instant communications, multi-colour newspapers, comics and magazines, chainstore consumerism, advertising, radio, and especially television goes into the classroom with a vaster store of experiences than his parents did. Yet unlike those of his parents who tasted life, his are both second-hand and passive; he is more an observer than a participant. Far from being awed by technology, today's student accepts and regards technology (particularly mechanical), as an integral part of his every day life, to the extent that in many cases it is re-shaping concepts and attitudes once held unquestionable. For example, in a recent editorial of Saturday Review Tobin described a study which concluded that prior to attending Kindergarten, the average American child devotes more hours to watching television than a student spends in class during four years of college. Of more importance, writes Tobin, are the research studies cited by Looney "that prove beyond any shadow of a doubt that over the past two decades the historical primacy of teachers and parents has been usurped by the electronic intruder" Tobin (1972, p. 39). Similarly Coldevin's research on The Effects of Mass Media upon the Development of Transnational Orientations (1971) among American adolescents indicates that television has replaced the family and to a large extent the school, as the major opinion formation makers.

Many educators become apprehensive with these findings and wrongly conclude that the impact of technology on education will result in the mechanization of instruction and their own eventual replacement. This need not be the case. On the contrary, as Kurland (1968) points out what we can hope for from the introduction of technology is not a

saving of manpower but of mind power (1968). Lord Bowden's parallel about the advent of the computer fits particularly well in this line of argument. He writes

Just as in the first industrial revolution machines relieved man of the necessity for much unpleasant physical work, so computers can relieve us of much detailed and stultifying routine mental effort ... . Machines are thus freeing the human mind in the same way as the human muscle was freed over a hundred years ago for greater, more important things (n.d. p 4.)

It well may be that an intellectual amplifier will emerge from today's inchoate educational technology.

#### The impact of the technology of instruction

Less noticable, but perhaps of greater magnitude on education than the mechanical aspect, has been the development of an intellectual technology that structures learning. Programmed instruction came to the foreground with the work of B. F. Skinner, and the so called "Stimulus-Response" psychologists (although Skinner does not consider himself an S-R psychologist (Evans, 1968; 1969)). On the principle that changed behaviour may imply learning and teaching is a process of behaviour modification (Silverman, 1968) the behaviour engineer proceeds through experimentation and varifiable outcomes to develop a technique whereby teaching and learning would proceed in a pre-determined pattern and with predictable results.

Goldiamond, for example, regards good educational technology as derived from good teaching theories [science], which in turn are derived from good teaching principles. Thus, Practice is the application of



knowledge, artistry and intuition leading to good or bad results; Science is the systemization and the making of generalizations drawn from the practices; while Technology is the application of science to solve practical problems (1968, n.p.).

Starting by practice, the behavioural scientist proceeds to develop, what Corey describes as "the process whereby the environment of an individual is deliberately manipulated to enable him to learn to emit or engage in specified behaviours under specified conditions or as responses to specified situations" (1967, p. 6). This definition identifies instruction (as opposed to the wider meaning of education) as a high structured process which stresses doing rather than knowing.<sup>3</sup> This factor, points out Gagne (1968, p. 6), is the most important outcome of the programmed instruction movement since what is being taught becomes an intellectual skill, not merely recallable verbal information. In this concept the learning of history, for example, does not consist in the memorizing and regurgitating facts and dates, but in understanding and interpreting them as factors that influence the way people live.

The stress on "process", not "content", and the importance of empirically verifiable results provide the basis for establishing instructional objectives (Mager, 1962; 1967), developing learning systems (Glaser, 1965b) stressing instructional design (Merrill, 1971). It leads to curriculum research which looks for relevant content

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<sup>3</sup>It is important to note, however, that as Silverman (1966) has described, the same process can be used to develop highly abstract conceptual skills. This point, particularly the need for open ended objectives, is discussed in detail in Chapter VI.

(Taba, 1962) rather than simply updating the information in old established subjects. The development of an intellectual technology of instruction has injected into the educational process the concept, and proof, that teaching / learning need not always be a hapazard activity where the outcome can, at best, be guessed. On the contrary, instruction can be structured and conducted in a manner that yields predictable results. The exception, of course, occurs --or should occur-- when instruction is devised to lead to open-ended results in such instances as games, seminars, debates and pure research.

### The Application of Technology TO Education

The use of audio-visual and other teaching-learning aids, and the application of communication theories to education are often regarded as synonymous with educational technology, in fact they are a good example of how technologies are often applied to the education process, rather than an illustration of a technology emerging within education derived from practice, as Goldiamond (1968) has suggested.

The emergence of film and radio devoted almost entirely to entertainment, and to a limited extent, as mass education media, quickly fired the imagination of many educators who imagined the limitations of the classroom spirited away by the new media. For example, a cartoon printed in all seriousness in 1923 by The Chicago Tribune and titled "The Changing World" illustrated Edison's prediction that motion pictures will replace books in the school. The presumed result, as the illustrations and captions indicate, will be that instead of the students having to be forced to go to school, mothers will get them to behave with

such admonitions as: "Now young man, if you aren't good, I'll not let you go to school today"; instead of shuffling their way reluctantly through the school gates, students will be waiting eagerly for the doors to open; instead of rushing out joyfully once school is over, students will leave reluctantly with such remarks as "Gee, it ended too soon", and "I wish we could have had another reel of that nature pitcher" (cf. Adams, 1965, p. 20).

The Yale Motion Picture Research Project (May, 1958), and the Pennsylvania State University (cf. Saettler, 1968 pp. 333-335) experiments with film and filmstrips as media of instruction in the armed forces, reinforced and gave official sanction to the above notion, even though these studies --among many others<sup>4</sup>-- did not provide conclusive evidence that audio visual instruction is more, or less, effective than conventional methods. The popularity and mystique of audio-visual aids increased with the spread of photography, and the greater access to filmstrips, films, and sound records.

Many educators hastily envisaged the use of these media as a means of enlivening instruction by introducing previously unavailable elements into teaching and learning; scenes and sounds remote from the school's area could be brought into the classroom for the students to experience. The wilds of Africa, the treasures of the Louvre, the President's voice, Beethoven's 5th, even scenes and sounds from the Bible

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<sup>4</sup>The research in this area is voluminous: the conclusions made in this section are based on literature consulted as listed in Appendix II: "Research Works on Audio-Visual Instruction".

or the remote, only imaginable first landing on the moon, were as close as the nearest film and record library. These might be brought into the classroom at the teacher's or student's convenience, a facility which undoubtedly could become a valuable asset in facilitating learning. However, exaggerated claims soon began to be attributed to audio-visual aids, claims that could not be sustained unless the aids were used in conjunction with good teaching-learning methods. For example, without any reference to pedagogy, content or evaluation, Hoban, Finn and Dale in 1950 claimed:

1. [Audio-Visual materials] supply a concrete basis for conceptual thinking and hence reduce meaningless word-responses of students.
2. They have a high degree of interest for students.
3. They make learning more permanent.
4. They offer a reality of experiences which stimulates self-activity on the parts of pupils.
5. They develop a continuity of thought.
6. They contribute to growth of meaning and hence to vocabulary development.
7. They provide experiences not easily obtained through other materials and contribute to the efficiency, depth and variety of learning (1961, p. 65).

Claims such as these remain the articles of faith put forward by the exponents of audio-visual materials. Naturally, such general claims can be attributed equally forcibly to other instructional sources such as a good book (especially if it is designed to specific course requirements), and even more so, to a good sympathetic teacher.

The main argument that 'aids' enliven teaching and increase interest, comprehension and retention is based on the hypothesis that the more abstract the contents of instruction, the more difficult it becomes for the learner to comprehend it. Conversely, the more lucid and nearer to "first-hand experience" the teaching material becomes, the

greater are the learner's chances of comprehension. Dale's Cone of Experience (1961 pp. 42-56) and its later adaptations by Torkelson's Concept Cone (1958), and most recently by Stewart's Synthetic Situation (1969), are based on this major hypothesis. Although one cannot disagree with this hypothesis, one can only accept it with qualified restraint for no amount of first-hand or simulated experiences can ensure that learning will take place if teacher, or students, or both, lack the interest, the motivation, and the right attitudes towards the subject matter. Further, the passive student facing a boring teacher will remain just as passive facing a boring or irrelevant film, filmstrip, television programme or programmed text. The failure to fully appreciate this point remains the major obstacle to the so-called Physical Science concept of audio visual aids. This machine oriented concept remains primarily concerned with improving the hardware, rather than enhancing the role of the hardware to help the student reach his educational objective.

In contrast, psychologists in educational technology building particularly on the work of Skinner and programmed instruction researchers, become more concerned with the role of teaching-learning aids in so far as these effect the learner's behaviour. For example, Goldiamond (1968) sees the role of educational materials, including books, as: stimuli that the teacher uses to reward the students for work well done; discriminative stimuli that provide information and instruction; deprivation variables or motivators for further research; constant stimuli where they become part of an ongoing instructional programme and are not introduced as a distraction; and, behavior creating or

producing stimuli (i.e. making a model, shooting a film, producing a classroom magazine), in the process of learning.

The audio-visual movement remained overtly concerned with the discrimination properties of educational materials. As Frieder correctly points out, much of the audio-visual activity is spent on improving their display potential in order to make learning seem pretty; he writes:

Books were printed with more pictures and colour or made into movies; movies were made into Kodachrome with full orchestration (1970, p. 30).

In The New Media: Memo to Educational Planner, Schramm et al. regret that due to a lack of understanding of the real role of the media in education, many educational systems still regard and use them in this limited way (1967a, Chapters 1 and 2), and consequently do not use media to their full potential.

#### Audio-Visual Aids, Communication and Education

In the 1950's, the focus of educational media thought shifted from their exhibitional properties to the claimed reliability in producing instructional results. This trend was influenced by the then popular research in Communication theories, which were regarded as being of paramount importance to the teacher-pupil relationship (Adams, 1965, pp. 27-29). The shift in focus was reinforced by the emerging studies in Programmed Instruction (Glaser, 1965a). However, while those associated with the Communications aspect of educational media remained primarily concerned with improving the efficiency of the stimulus display systems, those involved in Programmed Instruction

become even more concerned with the role of media insofar as these affected the learner's behaviour.

The proponents of audio-visual materials maintained that teacher-learner communication could be greatly enhanced with the use of educational media (Morris, 1963, pp. 9-14). Lasswell's Theory of Communication in the political sciences (1960), Shannon-Weaver's Mathematical Theory of Communication (1964), as well as Berlo's (1960), Schramm's (1954), and Gerbner's (1970), among many others, were adopted to confirm this claim. Typical of the audio-visualists, Wittich and Schuller based their handbook "Audio-Visual Materials, Their Nature and Use", on the thesis that:

Success in classroom learning is closely related to the clarity and understanding with which messages are communicated by teachers or by information sources which the teacher chooses to use .... The teacher must not only recognise interference possibilities but also know the means by which a clear channel of communication may be established and maintained with efficiency (1962, p. 15).

They conclude that audio-visual materials overcome the "interferences" or "barriers to communication" of day-dreaming, verbalism, referent confusion, limited perception, and physical discomfort; as well as counteracting the out of school interferences caused by the commercial and entertainment media. To which, Ends (1969, p. 187) adds a third set; The Intervening Variables of Prejudice, Experience and Cognitive Knowledge. Audio-visual materials, Wittich and Schuller claim, are "the means by which a clear channel of communication may be established and maintained with efficiency" (1962, p. 15). This approach again stresses the display properties of educational materials, and shows little concern for whether the study is ready, willing or able to

'communicate'; the student is taken very much for granted as the passive receiver.

This lack of attention to the student's attitudes and personal motivation is very much in evidence in the prominent audio-visual aids manuals, especially Erickson's (1965) and Kinder's (1965) in the U.S.A., and Cable's (1965) and Atkinson's (1966) in Britain. A notable exception to this trend are Brown, Lewis and Harclerold's (1964 rev) and Romiszowski's (1968) works. Although both books stress the importance of audio-visual materials as aid to communication, they equally forcibly stress the importance of selecting appropriate aids for accomplishing one particular type of objective, and stress the need for a 'feedback' mechanism that will reflect the learner's response.

In spite of the inherent presentational attributes of audio-visual materials and their potential contribution to education, their full value will not be realised as long as they are used simply as an addition to the regular classroom process. Gagne, quoting Thorndike's "Telling is not teaching", warns that even when audio-visual materials facilitate communication:

... one cannot simply equate communication with the process of instruction. Communication in its broadest sense of an event involving apprehension of a situation may be said to be an inevitable part of instruction, but by no means the whole (1969, p. 95).

Furthermore, communication implies a two-way process in which the sender becomes aware, by means of an immediate response, an end-of-term evaluation, or a cybernetic feedback device, whether the receiver has accepted the message.



Because many educators have equated communication with learning, unqualified claims of the efficiency of educational materials, particularly audio-visual aids, have been made. Yet, empirical research has consistently demonstrated that, while a particular medium proved to be spectacularly effective in some areas, with some learners in some situations, the same medium was much less effective when one or more of the variables were changed. While research studies repeatedly proved that audio-visual aids can be utilized as powerful elements in stimulating interest, supplementing instruction, aiding retention and influencing attitudes, no blanket claims can be made that in any teaching-learning situation, audio-visual aids provide improved instruction over those situations where they are not used. The use of mechanical technologies in the form of audio-visual aids may act temporarily as a placebo in the form of a "Hawthorne Effect" to the extent that the introduction of new hardware and novel modes of instruction may arouse enthusiasm and inquiry into teaching and learning. However, they have not materialized as the panacea many audio-visual zealots have prophesied. On the contrary, as Murphy and Gross (1966) point out in their report to the Ford Foundation evaluating the first ten years of television teaching, the indiscriminate use of educational materials will serve only to perpetuate old and inefficient methods. Ineffectual instructional methods shown in instructional television lessons are often regarded by many teachers as model lessons, and are imitated; (fortunately, good television lessons should have the same influence).

The blind acceptance once accorded to audio-visual aids by many educators is being reviewed. Reports of findings about how

people learn, notably by Bruner (1963) in the transfer of learning and concept forming; by Gagne (1965) in defining eight kinds of conditions for learning; by Hilgard (1956) and Piaget (1969) in sequential development; by Vernon (1962) and Spaulding (1955) in perception; by Skinner (1964; 1968) and Glaser (1968) in programmed instruction; by Bloom (1956) and Krathwohl et al. (1964) in developing a taxonomy of educational objectives; by Mager (1962) in defining instructional objectives; and Tyler (1950) and Taba (1962) in curriculum development, all place the role of educational materials in a proper perspective among many other factors that lead to learning within a technology of education.

#### The Development of Technologies WITHIN Education

The concept of applying technologies within education recognizes and accepts, but at the same time seeks to incorporate, the impact and contribution that mechanical and intellectual technologies can have on education. It is appropriate for adherents to this view of Educational Technology to seek out ways of incorporating the developments in learning theory, in the production and utilization of educational materials, in new curriculum content, and in planning and management practices into the educational process in order to enhance it. Consequently the interest of the educational technologist in educational materials, for example, does not lie in proving how powerful or effective they are in teaching but in devising means for them to be utilized efficiently in the learning process. A similar situation emerges when one considers curriculum development, pedagogical change and educational planning.

The educational technologist's interest in curriculum development derives from his concern about the student's desire to undertake meaningful learning experiences. He sees the need for the student to learn "how to learn", devise his own learning environment, understand what he is doing and why he is doing it, rather than to repeat without understanding what had been drilled into him. The educational technologist's interest in new pedagogy, particularly in instructional design, derives from the stress programmed learning theory places on what Ullmer describes as:

... the contention that instruction is a process that can be approached in a systematic or technological manner, in which the numerous parameters relevant to the efficiency of instruction can be identified, analyzed and manipulated toward the end of prescribing optimum conditions for learning based on and validated by scientific inquiry and measurement (1968. p. 11).

The educational technologist's concern with planning derives from his conviction that "the numerous parameters relevant to the efficiency of instruction" can become most effective when educational needs are identified and problems specified, so that all the resources of the system are planned, organized and managed within the constraints of the society that will benefit from them.

The inter-relationships between the parameters is brought together by the (British) National Council for Educational Technology through its definition of Educational Technology as "the development, application and evaluation of systems, techniques and aids to improve the process of human learning". It goes on to say that:

implicit in this definition is a concern that learning objectives should be carefully considered at the outset, along with the means of assessing whether these objectives have been attained. Educational Technology is thus concerned as much with the needs of the learner as with those of the teacher or trainer. In interpreting this broad view of educational technology the Council includes the search for improved productivity in education and training. In addition to giving attention to greater effectiveness where the learning process is concerned, it considers as equally important the securing of greater efficiency in the management of this process. The council therefore has a direct interest also in questions of utilization of manpower and plant, and in the interrelationship of finance, planning and administration. All these considerations imply a carefully-planned use of the resources available, taking "resources" in the widest sense to include human, material, architectural, financial and other elements in the design of learning systems for educational and training purposes (1969, n.p.).

This statement spells in more detail Eriksson's definition that:

Educational technology is concerned with the development and application of theories, strategies and methods to synchronise and facilitate the complex progression from the derivation of overall educational goals of a social unit to their gradual transformation into instructional settings and learning situations combined into a working education/training program (1969, p. 62-3).

The foregoing makes it obvious that an educational technology policy for Malta will not be as concerned with increasing the utilization of educational hardware and software as it will be with improving the effectiveness of the learning process through, what the Journal of Educational Technology identifies as:

... work in the fields of the psychology of learning, audio and visual methods of presentation, educational planning and organization, curriculum development and course design, the production of teaching and learning materials, the storage, retrieval and dissemination of information, the allocation of resources, the cost and effectiveness of media in education, the design of learning spaces and the problems of innovations" (1970, p. 5).

While the development of mechanical and intellectual technologies in these fields is important, of greater importance is the development of an educational technology that structures the findings of the other technologies to produce predictable, verifiable and reproducible instructional results. Thus, while the presence of hardware, for example, may be important, sometimes crucial, the proper utilization of educational technology does not always depend on it (cf. Gagne, 1968). An educational technology policy for Malta will hold such a principle as a tenet.

## CHAPTER V

### TOWARDS AN EDUCATIONAL TECHNOLOGY POLICY

The proposed educational technology policy for Malta recognizes that the resources at the disposal of the Malta Department of Education vary: some are plentiful, others limited. For example, Malta does not have a shortage of teachers or schools. The national teacher:student ratio of 1:20 in the primary schools, and the 1:12.3 in the secondary schools (Cameron, 1970, pp. 15-16), as well as vacant school-building space (Cameron, 1970, pp. 18-19) are factors that place Malta in an enviable position. The Maltese' high regard for education (Boissevain, 1965, p. 51), and the dedication and goodwill of the teachers (Lewis, 1967, p. 11), are other vital assets. Yet the Department lacks sufficient finances, educational materials --both equipment and soft-ware--, and it is cautious about innovations (Lewis, 1967, p. 2; Cameron, 1970, p. 7). The latter tendency often prevents the educational system from better utilization of the resources that are available.

The educational technology policy will also recognize that the demands on the educational system for improved and expanded educational opportunities are likely to increase. Once secondary education becomes universal, the system must plan for improved and expanded educational opportunities at the higher levels of education. With the conversion of the Islands' economy, the educational system must plan for the

provision of improved and expanded Vocational and Further Education, and eventually, for Educational Permanente. This educational technology policy will recognize the fact that an expansion and improvement of educational opportunities will be accompanied by an increase in cost of delivering them.

Faced with these demands, the Department of Education can follow one of two alternatives: either continue with present attempts to stretch further its resources to meet the increasing demands of its expanding commitments; or alternatively, the Department could find ways of utilizing its present resources even if the chosen methods do not comply with tradition. The observation by Helmut Oeller, director of Germany's Tellekolleg, that one cannot assume that society will be able to overcome the critical demands made on it with the help of traditional educational policies (1970, p. 2), is especially pertinent in attempting to formulate an educational technology policy for Malta. So is Maheu's remark that it is impossible to conceive that the tasks faced by educational systems can be undertaken without major changes in processes of providing education, he continues:

To meet the challenge of the times it is essential to improve traditional methods, so as to increase their efficiency, and to adopt new teaching methods.

.....

New educational techniques and methods, however useful in themselves, can hardly be expected to produce desirable results if used alone, since no single teaching tool can serve all purposes. The methods, teaching aids, media and techniques work best to help the educator and student if they are planned to form an integrated whole (1967, pp. 5-6).

So far, the educational system has relied on the first choice of action and has attempted to solve its problems through the re-organization of the Department of Education resources for better utilization. It appears that this approach has been generally successful since so many resources had been under-utilized. However, for reasons to be elucidated later, it is reasonable to assume that further re-organization on the traditional pattern (if it were possible) cannot yield significant benefits, to the extent that the educational system will be unable to meet satisfactorily the community's future educational needs, especially as these increase when the Islands' projects for diversification of the economy and changing work patterns become more widespread. This educational technology policy proposes an alternative approach.

The purpose of an educational technology policy for Malta will be to assist the ministry improve the nature of, and expand the opportunities for education by systematic development, application and evaluation of techniques and resources available for teaching and learning.

The educational technology policy, therefore, will assist the Maltese educational system at two levels. It will help at the national educational planning level to identify educational objectives which meet the needs and goals of the community and to utilize most profitably national resources to meet these goals and needs. The educational technology policy will also help institutions and teachers at local level to derive the best advantage from curriculum development, methods of teaching and learning and utilization of resources.



An educational technology policy will translate the general or specific objectives of the educational system as identified by the educational planners, into the most effective process of planning and designing for instruction. Stated in another manner, an educational technology policy will assist in (1) educational planning for effective utilization of the community's human and material resources, (2) the establishment of objectives for curriculum development and improvement of pedagogy, and (3) the effective utilization of educational materials, in order to help the educational system meet society's demands for improved and expanded educational opportunities. Thus, the aim of the educational technology policy will be the greater effectiveness and the greater efficiency of the Maltese educational system. In effect it attempts to comply with the Unesco consultant's recent report where it recommends that:

Curriculum revision and development should result from investigation and experiment including the design and testing of subject matter, teaching materials and teaching methods. (Lewis, 1967, p. 14);

and,

Determined steps should be taken to improve the supply of learning and teaching equipment and materials ....  
(Lewis, 1967, p. 14);

and,

... to determine how best the existing resources can best be used for educational purposes and what additional resources are needed to make the maximum use of the media (Lewis, 1967, p. 25).

The proposed policy will attempt to achieve the above aims by utilizing and co-ordinating the human and material resources available to the Ministry of Education. It will draw upon the services of general and specialized teachers, educational planners, educational psychologists, sociologists, teachers of teachers, curriculum and pedagogy experts, systems and design consultants, and managers of resources, to develop strategies that utilize most efficiently the human, financial, mechanical, architectural and environmental resources. An educational technology policy will seek the optimum means of making available to the learner the combined and co-ordinated results of its implementation, in a way that will enable the individual and his community to derive the best possible use of them.

Implicit in educational technology is "system." Consequently an educational technology policy for Malta will tackle its tasks through the "systems approach" of: identifying educational problems and the alternative ways to solve them; establishing objectives and validating them; programming and synchronizing the variables into the instructional design that most likely reaches the stated objective; and validating the entire instructional process and its outcome through empirically proven tests.

This policy will attempt to fulfill Becher's job description of an educational technologist where he states that:

The job of the educational technologist [educational technology policy] is to build a bridge between resources and requirements. He must know enough about education to see which way it is developing and what are its real needs and problems; equally he must know enough about technology to be able to see what genuine contributions each new development in learning research, in techniques of communication, in management theory or in systems analysis, can make to solving these needs and problems. Unless educational technology has this dual role, its value will be severely limited. If it concentrates only on technology, it will almost certainly misapply that technology by distorting the nature and purpose of education .... But if it concentrates only on education, it will almost certainly overlook many of the valuable contributions which technology can make in promoting more effective and more efficient ways of enabling learning to take place... (1969, p. 192).

### Assumptions

In order to achieve its aims, the educational technology policy must be based on the following four major assumptions:-

1. That, once having established its general and specific educational objectives, the Maltese educational system will undertake curriculum and methodology development and utilization programmes to establish the best means of reaching those objectives.
2. That, prior to their acceptance and general adoption, instructional content, pedagogy, and educational materials (including radio and television broadcasting), would first be tested and validated to appraise their effectiveness. Inherent in this assumption is another: that in the adoption of new curricula, pedagogy and educational materials, the stress would primarily lie on the structure of the educational process, so that the selection of content, instructional methods and educational materials would be determined by the requirements of that structure.
3. That validated instructional methods will be achieved only if the appropriate attitudes and environment towards educational technology are

cultivated by the Department of Education. Inherent in this assumption are two others, namely (a) that the teachers must be trained to function within the educational technology context; and (b) that the necessary educational materials, equipment and physical facilities to achieve these ends must become available.

4. That the technologies of planning, developing, writing, organizing, producing and testing educational projects are quite specialized and require different human talents and adequate resources. The policy, therefore, must reject the wholesale acceptance of educational technology through an uncritical or promotional approach, since this often leads to its misapplication. Thus it must provide for training and operating context of competent practitioners yet it must avoid the approach which Geis defines as that of the specialist with a solution in search of a problem (1970, p. 25).

The fact that Malta is starting late in the field can help the educational system benefit from other countries' experiences. For example, in Nigeria educational television could not reach its full potential since it was introduced without first establishing its objectives, without estimating the constraints, and without providing for the technical, personnel and organizational resources to support it (Schramm et al., 1967a, pp. 30-32). The educational technology policy for Malta can avoid the development or introduction of instructional methods or educational materials which would simply serve as status symbol indicators, for which educational objectives and content have to be created whether they are really required or adequate. Instead, Malta can learn from projects which specify educational objectives,

scrupulously analyse the constraints and the capabilities of the project, select and design their resources to fit the required educational objectives. The use of educational radio in Thailand, the U.N.R.W.A. -Unesco teacher training scheme, educational television in Samoa, the Japanese, Australian, and Italian broadcast-correspondence schools (Schramm et al., 1967a), Telekolleg in Germany (Schardts et al., 1970), and the British Open University (Pentz, 1969), are some of the well documented examples where positive, systematic planning resulted in the efficient and beneficial use of educational materials, and should be used as appropriate examples of effective educational technology use.

This policy formulation takes as axiomatic, the assumption that the term "educational technology" is understood to signify the application of technological principles within the educational process, and not the simple introduction of technological products to conventional teaching and learning situations. It further takes as axiomatic the assumptions that "educational technology" has its roots in these areas: (1) the effective utilization of national resources, (2) curriculum development and methodology reform, and (3) the efficient and effective application of educational materials. The basis of these assumptions, the role of the three main elements of educational technology, and the implications on an educational technology policy for Malta are developed and discussed in the following chapters.

## CHAPTER VI

### THE SYSTEMATIC PLANNING OF LEARNING THROUGH CURRICULUM AND METHODOLOGY REFORM

Malta, like most other countries, is concerned with the need for curriculum innovation. Several reasons account for this, mainly that the old curricula do not meet the exigencies of the expanding educational system and the Islands' new manpower-training requirements.

The introduction of the "Secondary Education for All" scheme and the resultant inflow of students, has introduced into the previously highly selective secondary school system a diversity of interests and abilities which its traditional curricula cannot cope with. The traditional secondary schools had one aim: to prepare their students for the General Certificate of Education or Matriculation examinations. Consequently their curricula were devised to cater for an elitist group of students destined for the professions and ancillary white-collar jobs. The Islands' changing economy and its industrialisation make it essential for curricula to be updated to cater for the students' new needs and interests, and fit them for new job opportunities being created. Bro. Charles Gatt (1970b) Principal of St. Michael's College of Education, has suggested that the new schools take the lead in developing different curricula instead of a universal and uniform one, so that depending on their location and the community's interests, they would develop a special interest (i.e. in agriculture, catering, nautical work, music,

or commercial subjects).

Such radical innovations could not fail but have widespread ramifications in other sectors of the educational system, especially in the primary section. Here the curricula would be modified and updated to keep up with the new interests of the secondary schools. These were the experiences in Malaysia (Morris and Hawson, 1970, p. 8) and Columbia (Illich, 1970) which, like Malta, recently extended considerably their secondary school system, as well as in Britain (Morris and Hawson, 1970) with its decision to raise the school leaving age to sixteen.

Even without these extraneous factors, curriculum reform becomes mandatory due to such factors as the information explosion, the ever decreasing time lag between the acquisition of knowledge and skills and their obsolescence, and the increase of students with diverse interests which present curricula do not cater for.

#### Curriculum Development and New Needs in Education

Traditional curricula were based on the assumption that one's life was divided into two general periods which Henri Dieuzeide (1970, p. 12) calls the "Formation" and the "Production" phases. In the "Formation" period the individual learned, "swallowed" knowledge, rules of conduct and taboos which were intended to guide him to fulfill his role in society. In the "Production" period, the individual lived according to, and depended on the knowledge and skills he acquired in the first period. Curricula based on such a premise are no longer tenable in an industrial society with its continuous demands for innovation and mobilization.

In a technical, industrial society, knowledge, like machines, becomes outdated by the time, sometimes before, it becomes usable. A few examples from current literature gives some idea of the rapid growth of information explosion and its effect on traditional concepts of permanence and obsolescence. Alvin Toffler (1970, p. 31) claims that the present rate of scientific and technical literature alone amounts to 60,000,000 pages a year.<sup>1</sup> Arthur C. Clark (1968, p. 33) maintains that every communications satellite built during the next ten years will be obsolete (albeit still useful) as soon as it is launched; Burns and Brooks (1970) estimate that in a single decade man progresses as far as from the beginning of man to the first year of that decade. According to Oppenheimer the number of scientific inventions multiply according to a geometrical rate of progression, while Purcell says that 90% of all scientists who have ever lived, live in the present age (cf. Dieuzeide, 1970). On the same theme, Seth Spaulding, Unesco's Director of the Department of School and Higher Education, points out that probably one-third of the technical specialities performed in an industrialized country did not exist twenty-five years ago, and that as many as one-half of the technical specialities which will exist in the early years of the next century, do not exist today. "Yet", he concludes, "we must teach students now who will be at the peaks of their careers in the first quarter of the next century" (1971, p. 10-11).<sup>2</sup>

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<sup>1</sup>This of course, does not mean that all the information contained therein is new or worthwhile, but neither can the same claims be made of what was written when the volume was much less.

<sup>2</sup>Anyone who might be tempted to dismiss the above with the familiar "But it won't happen in Malta", need only look at the current intensive job-retraining programmes being undertaken at the heavy expense on the resources of the Department of Education.



The implications of the above on curriculum reform in educational systems, and on an educational technology policy for those systems, can be formulated by the following questions:

1. Should educational systems continue to base their curriculum on outdated, or soon to be outdated information, and perpetually provide new-retraining programmes, which in turn would become outdated?;
2. Should educational systems be expected (if it were possible) to teach and train their students for job-related skills of thirty years hence?;
3. Should educational systems develop curricula and methodology that stress less the cognitive and content aspect, and concentrate more on the learning process of education and thus help students become self-directed learners? This chapter develops the theme that educational systems have been attempting to fulfill the demands of the first choice when they should be concentrating on developing curriculum and methodology reform to meet the requirements of the third, more sophisticated choice.

Peters in his concept of "Education as Initiation" (1966) suggests that educational systems can adopt the better features of traditional curricula and methodology which stress the cognitive and content aspects of education, and utilize them in educational experiences that rely on the learner's desire for discovery and motivation. This argument is supported by Macdonald in The Discernible Teacher (1970, Chapter 3). Peters maintains that both aspects are compatible and necessary, on the criteria:

- (I) that 'education' implies the transmission of what is worthwhile to those who become committed to it;
- (II) that 'education' must involve knowledge and understanding and some kind of cognitive perspective which are not inert (1966, p. 45)<sup>3</sup>.

However, accepting these criteria as valid, an educational system involved in curriculum reform remains concerned with the question of what is educationally "worthwhile" and which "knowledge and understanding" features are worthwhile for inclusion in its curriculum.

#### The wider aspects of a national curriculum

In a democratic society an educational system considers "worthwhile" those educational opportunities which (a) fulfill the individuals' intellectual and vocational aspirations; and (b) fulfill the manpower and economic requirements of the nation.<sup>4</sup> In practical terms, an educational system has to include content that caters for "skill" and the "growth" requirement of the community.

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<sup>3</sup>Peters includes a third criterion, namely "that 'education' at least rules out some procedures of transmission, on the grounds that they lack wittingness and voluntariness on the part of the learner", however this criterion will not be discussed in this context on the assumption that in a democratic society, the learner exposes himself to education voluntarily. Even if the adult has pressure placed upon him for further education by job exigencies, and the young pupil is compelled to attend school by the Compulsory Education Act, the former can choose against further education, the latter can refuse to partake fruitfully in the educational experiences he is exposed to in school, an option that many students select.

<sup>4</sup>A state-run educational system in a democratic society endeavours to achieve the latter without curtailing the right of the individual to achieve the former.

In the "skill" area, the curriculum equips learners with techniques that help them achieve self-realization in their present or future jobs. In the "growth" area, infuses individuals with the need to find self-realization as educated persons. As Peters point out (1966, Chapter I) --although not in exactly the same terms-- this infusion of the "skill" and "growth" areas, goes beyond the concept of vocational training and intrapersonal reform when considered separately. A good instructor can teach his students to perform well a certain set of skills such as reading, writing or solving mathematical problems; but he can only call himself an educator when he enables his students to extend the application of these skills to the wider aspects of, among other things, appreciating literary works, expressing themselves in written form, or applying the logic of mathematical problem solving to other problem solving situations. In this context, a "worthwhile" education does not simply give students opportunities to become skilled, knowledgeable or well-informed in a particular field, but also prepares them to extend their knowledge and skills to larger perspectives and larger aspects of life. This is the wider aspect of what is educationally "worthwhile".

An educational technology policy for Malta will concern itself with the wider aspects of what is educationally worthwhile: hence its involvement in educational planning. It will also concern itself with the selection, preparation, presentation and validation of the restricted aspect of subject matter. This aspect that takes the form of "worthwhileness" of curriculum content, including the cognitive element, that the individual student encounters in the process of acquiring an education. It is this aspect that often raises most concern

about the "relevance" of curriculum content as expressed in the terms referred to in the beginning of this chapter.

### Curriculum and methodology

The point has been well put (Taba, 1962; Peters, 1966; Axelrod, 1969; Macdonald, 1970; Mitchell, 1971d, 1972a) that such concern refers to only one part --and not the most important part-- of the problem. They point out that curriculum content reform cannot be separated from the accompanying reform in methodology. Replacing outdated knowledge by up-to-date information does not ensure relevance; nor does it ensure that new knowledge will not, in turn, become outdated. Simply replacing old for new information reflecting an assembly line mentality, will help little.

Taba (1962) has pointed out that selection and arrangement of content is only one important factor of the learning process; equally important are the choice of the learning experiences by which this content is manipulated, and the conditions under which learning takes place. Postlethwait et al (1964) and Beeby (1970) explain that an educational system cannot contemplate curriculum reform without implying reform in its modes of instruction.

Glazer (1968) reasserts the above observations, and points out that such arguments should raise doubts about the emphasis placed on formal instruction and traditional examination procedures. He also points out that such arguments should raise concern not only about curriculum content reform, but also about the failure to pay sufficient attention to ways in which students learn and new techniques of assessing

their performance. Such concerns, point out Kay et al. (1969), have remained within the realm of behavioural psychologists and educational technologists in the area of programmed instruction; they have failed to spread to other educational areas. The result has been that educational systems limit themselves to modifying the content of the curriculum instead of improving the methods by which it is taught. Consequently, they continue to transmit new knowledge through old channels. Furthermore, Axelrod (1969) points out that even when instructional methods themselves are examined, attention is often focused on the means of improving existing methods rather than on possible radical changes in method, or on the more fundamental question about the teacher's and learner's role in the learning process.

#### Lack of a General Theory of Learning

Broudy (1966, pp. 23-24) points out that the major obstacle to the development of effective instructional practices has been the lack of a general theory of learning (1966, pp. 23-24). Hilgard (1956, p. 9) writes that while there are several theories of learning, each seems to be derived from a close study of some single type of learning, (usually a very simple one), yet all the findings from these specific types of learning are applied to all types of learning situations. Thorndike had made a similar observation when he wrote:

... there is no chance for a simple general theory (of learning)  
 ... The true general theory must be the helpless one that there  
 can be no general theory, or that it must be made up of such  
 extremely vague conclusions as the features common to all  
 human natures and the changes everywhere desirable now  
 (cf. McKenzie et al., 1970, p. 43).

Hatch and Bennett (1960) point out that research has failed to produce a "general method" of instruction, and that the consensus of studies made since 1920 show that no mechanical device, in and of itself, is better than another. Teaching either by lecture, recitation, discussion, tutorial, ready-study, reading quiz, correspondence, or several different teaching methods has not been demonstrated to be intrinsically more effective than the next method, and that motivation for learning is the most important variable. They argue that in view of these facts, the research should be redirected from looking into the effectiveness of teaching, to establishing effective techniques of learning. Such arguments have led to the "learning to learn" concept.

Taba by joining the "learning to learn" concept to the obsolescence factor (where basic ideas change rapidly and where theories are reshaped from time to time), argues that the knowledge of most worth is least likely to be found among specific facts and concrete descriptive ideas for these will change most rapidly and are the least productive of new ideas. She continues,

An understanding of the general principles which have the broadest range of application and which are the most potent for creating new knowledge is a more promising and creative educational investment. It seems, then, that the common heritage most needed for the future and the background needed to equip the young generation to live in our culture is contained less in the common bodies of factual knowledge than in the way we fit people to think about whatever knowledge they have or about the problems on which this knowledge bears. These, then, should be the fundamentals to which curriculum, teaching, and evaluation should be addressed (1962, p. 185).

These assertions are borne out by Scheffler (1960) and Peters (1966) who, while retaining the argument for the need of cognitive background, have developed concepts based on the assumption that

instruction can at the same time be acquired through the inquiry and discovery methods. For example, in The Language of Education, Scheffler points out that one cannot expect students to discover everything for themselves, and that acquisition of basic information and skills is mandatory for exploring into the higher and more refined levels of learning. He uses the corollary that to throw a child in the river is not the same as teaching him how to swim even if he does manage to do so. Scheffler goes on to point out, however, that providing the learner with the basics is only one part of the instructional process, the other part should concentrate on providing him with reasons and purpose for participating in the instructional process (1960, pp. 57-58).

Peters, after stressing the point that the acquisition of knowledge is an important factor in education, explains that the function of knowledge is to be a means to an end, not an end in itself. He writes:

Education ... should be very much concerned with acquiring a solid body of knowledge in a differentiated way without which all talk of 'understanding principles' and of developing a critical and inquiring mind is sheer cant. But this body of knowledge must be acquired in a way that does not discourage curiosity, interest and the desire to strike out on one's own. The overall aim of education is to get children on the inside of the activities and forms of awareness characterizing what we would call a civilised form of life (1966, p. 81).

Adhering to the same principles, Bruner proposes that instruction should include those experiences that will motivate students to engage in methods of scholarship, inquiry, problem-solving, or critical thinking, so that they can gradually move from a reliance on extrinsic rewards to those which are intrinsic. In this approach, claims Bruner "Knowing is a process, not a product" (1963, pp. 33-54).

A counter argument to Bruner's and similar approaches is held by traditionalists who maintain that subject matter has its own built-in logic and that the study of specific facts in a subject reveals and implants that logic. Furthermore, many content-oriented educators assume that certain subjects, such as mathematics, the physical sciences and Latin, have a greater power to train the mind than others, and they do not lend themselves well to the discovery approach (cf. Taba, 1962, pp. 182-189). Still others (cf. McKenzie et al, 1970, p. 105) question whether it is legitimate to assume that simply exposing students to the general principles and generalities of a subject would lead to the full understanding of those principles, and the ability to apply those principles to specific situations.

These conflicting claims and the lack of significant research to solve them have led to the "black-box" mentality (Crawford and Ragsdale, 1970) which has hindered the development of "a balanced curriculum and of balanced education" (Taba, 1962, p. 182).

#### The Role of Educational Technology in Curriculum Development and Methodology Reform

McKenzie et al. argue that the lack of an acceptable general theory of teaching need not restrict the search for a "balanced curriculum" and an effective methodology. They write:

... we must take very seriously the insistence of those who urge that we should now focus our attention upon the facts of the instructional process rather than on interpreting them... . If, to take a single example, there is agreement that rewarding successful performances strengthens the possibility that the next attempt at a task will be successful it does not greatly matter at the first stage whether the explanation offered is contiguity, reinforcement or communication theory. For the fact that rewards produce better results can be established empirically, and it can then be used heuristically to tackle a further problem (1970, p. 46).



They further point out that it was not necessary for the Wright Brothers to possess an advanced theory of aerodynamics before they flew their first plane at Kitty Hawk. Such arguments follow Hilgard's (1964) who maintains that it is possible to make headway even when learning theorists are in disagreement. In fact Hilgard rejects the belief that a sophisticated and accepted learning theory is a pre-condition of any systematic principle of instruction (1964).

An educational technology policy for Malta will attempt to identify through systematic research what areas of curriculum content require changing, which instructional methods need to be revised, and what activities and motivational factors are most likely to be successful in "initiating" and facilitating "worthwhile education".

In his concept of "education as initiation", for example, Peters has shown that curriculum content and methodology can be fused together to promote learning. He has shown how on occasions curriculum content relevance takes second place to the instructional/learning process. He explains how in the concept of "education as initiation" at primary school level, the question of content relevance need not arise; at secondary school and higher levels, while content relevance takes significance in skill and job related subjects, it need not feature prominently in many areas of the curriculum.

At the primary school level, the student is still largely tied to what Piaget calls the Concrete Operations Period (cf. Phillips, 1969, Chapter III) and is very much concerned with his immediate surroundings, so that the relevance of content, and consequently interest, can be

created through the process of instruction. This does not mean that educators need not concern themselves with content, particularly its accuracy; it means that they should be more concerned with the process of making content meaningful to their students. To give an example from a topic frequently encountered in the Maltese primary schools curricula, "The People of Africa" may not be immediately relevant to the learner's needs or interests, but the teacher's ingenuity in presenting the topic and eliciting students' participation, can render it an interesting and meaningful experience. Furthermore, the student, who at a later stage desires to find out about his new pet dog --a presumably immediately relevant topic--, can repeat the process he had participated in when finding out about "The People of Africa". This process can lead to self-instructional methods, where the need for relevance, individual capabilities, and personal inventiveness and creativity are catered for.

At secondary schools and higher levels, the learner becomes more concerned with his own particular interests. Relevance in curriculum content becomes important especially in those areas that are related to his job, or qualification requirements; every possible step should be taken to satisfy these interests. At the same time, however, the argument that the process of learning is of greater importance than content, still stands. Learners at secondary school level have reached what Piaget calls the Hypothetico-deductive Thinking Stage and can transfer learning from one situation to another. Therefore, as he reaches the more advanced stages of his education, the student can function at the higher level of the Cognitive and Affective Domains (Bloom et al., 1956;

Krathwohl et al., 1964) where the intellect plays a more important part than the content. Thus curriculum content is utilized, and learning activities pursued for their extrinsic rather than intrinsic values.

In practical classroom situations this means that literature becomes regarded less as a study of style, and more as a means of increasing the power of self-expression, the better understanding of man's behaviours or gratification from literary beauty. In this context, language teaching stresses the development of the individual's power to communicate; students do not study history to regurgitate endless dates and figures but to understand the importance of the past for its ability to explain the present; while a more international outlook of history and geography calls for the study of how other people came to be as they are. Geography becomes increasingly concerned with the environment and man's influence on it. These concepts shift the practice of instilling students with facts, towards that of training them to make deductions from observation, and learn how to tackle and solve problems for themselves. Good examples of such curricula are found in Britain through the Nuffield science, mathematics and language projects (Morris and Hawson, 1970), and in similar projects in the U.S.A. through the School of Mathematics Study Group, the Biological Science Curriculum Study; and the Chemical Educational Maternal Study (Taba, 1962).

Several Maltese schools already use the Nuffield courses, and due to their promotion by the Colleges of Education, one can safely assume that they will feature more prominently in the future. This in itself augurs well for future curriculum and methodology reform.

However, regardless of the merits or lack thereof of the Nuffield projects, the total, uncritical acceptance of such projects may easily lead to the large-scale importation --doubtlessly aided by the promotion and enthusiasm of local educational materials wholesalers-- of alien curricula totally incompatible with the local educational requirements. In other words, history will continue to repeat itself, only the impact will be greater since several and perhaps more potent media other than books will be involved.

The same applies to methodology. As discussed elsewhere in this work (See Chapters I and IX), individual teachers, groups of teachers, and sometimes entire schools, oft-times experiment with teaching and learning methods which they might have read or heard about, participated in, or sometimes been told to conduct. While one cannot criticize or doubt the goodwill and good intentions of such experimentation, one needs to question the professionalism of such research. While some teachers might be admirably qualified to conduct such research, others may not, and under present conditions there is no way of telling the difference.

An educational technology policy will help to develop applicable curricula and effective methodology practices. It will attempt to correct obvious content discrepancies (such as topics that refer to the British Empire as if it has not changed since 1937; the practice of requiring students to learn about foreign countries before they know sufficiently about their own; the use of seemingly educational situations pertaining to civics, religious, or even mathematical problems which no Maltese is ever likely to be confronted with except in the classroom),

and the not so obvious discrepancies such as reading matter that purports to depict contemporary Maltese society through inaccurate, outdated --if cute and romantic-- social concepts. It will evaluate the need, desirability and validity of importing foreign curricula and educational materials, and modify them for local usage. The policy will, above all, initiate and co-ordinate research into the development and promotion of instructional techniques compatible with the concept of "worthwhile education".

The above mentioned activities will need to be conducted through scientific methods, and results established on empirically validated data that not only will serve as concrete evidence for accepting or rejecting them but also will form the basis for the establishment of "teaching" as a truly professional discipline (cf. Macdonald, 1970).

### Instructional Design

The advantage of systematic methods in a technology of education lies in the fact that while conventional methodology adopts "rule of thumb" procedures based on some teachers' experience and folklore, they are based on instructional practices found on empirically verified or verifiable principles. Goldiamond points out that good educational technology is derived from good teaching principles which in turn are derived from good teaching practices (1968). The term Instructional Design is becoming increasingly associated with these procedures.

Merrill defines instructional design as the

... process of specifying and producing particular environmental situations which cause the learner to interact in such a way that a specified change occurs in his behaviour. Instructional design further includes the process of monitoring a student's interaction with the structural environment to enable the designer to assess the effectiveness of a particular design (1971, p. 17).

The theoretical and methodological foundations of instructional design derived from procedures that have evolved largely out of behavioural psychology and research and development studies in programmed instruction (Friesen, 1971). Programmed Instruction has developed far beyond the rats, pigeons and push-button stage usually associated with it.

Instructional design research would deal with its four basic components as developed by Glaser (1965b) namely (a) developing learning objectives (b) analysing the learner's entering behaviour, and (c) designing the instructional environment, including the utilization of educational materials, and (d) evaluating the terminal behaviour.

#### Defining learning objectives

Discussing "aims" in education, Peters writes:

It is obvious enough, therefore, why the term 'aim' is used so frequently in the context of education. For this is a sphere where people engage with great seriousness in activities without always being very clear about what they are trying to achieve, and where genuine achievements are hard to come by (1966, p. 28).

The defining of educational objectives attempts to clear some of the ambiguity.

In defining learning objectives a distinction should be made between terminal behaviours and the general educational goals. As explained earlier, the goals of education should be long range and

involve complex behaviours and aspirations. The specifications of these goals involves philosophical and ethical considerations for which the teacher must share responsibility with the other members of his society. Defining learning objectives as terminal behaviours requires specifying students' performance after learning has taken place, so that the terminal behaviour becomes the end product of a particular learning situation (Silvern, 1968).

In a formal learning environment, the teacher (or someone else for him, i.e. the curriculum development unit, the headteacher, his colleagues in a team-teaching unit, or occasionally his students) determines the learning objectives. In traditional instruction these objectives usually consist of lists of generalized aims expressed in such terms as learning to read and speak English, appreciate Maltese history, develop in students a sense of responsibility, teach students to think, and teach students to type. Tyler (1971, pp. 89-96) argues that such statements can be, and are, interpreted by teachers in a variety of ways that, more often than not, are quite meaningless to students. The proper defining of objectives attempts to replace ambiguous aims such as "to learn, to appreciate, to understand" by more specific ones such as "to translate from memory the following English words", "to identify correctly and list the four main causes leading to the Great Siege of Malta", "to solve the equation  $(a + b)^2 = a^2 + 2ab + b^2$ ", "to make a dove-tail joint", "to type without error at the rate of 90 words per minute".

The difficulty of setting up learning objectives has been greatly reduced with the development of classification schemes for

intellectual abilities and levels of understanding, notably by Bloom and his colleagues (Bloom et al., 1956; Krathwohl et al., 1964).

Bloom's taxonomy identifies three major classes of objectives: cognitive, affective and psychomotor, and has developed schemes for the cognitive and affective domains.

One hazard inherent in establishing instructional objectives, is the danger of over-operationalising objectives, lowering the level of one's objectives to make them measureable. This can be avoided by checking the operational objectives back against one's original list of manifestational objectives. As Lave and Kyle (1968) point out, educational achievements are more difficult to measure and evaluate than those in other fields where the results are often immediate, however, the difficulty is compounded when objectives are expressed in a form which makes them impossible to validate (1968, pp. 39-55). As Mager points out, the teacher who defines specific learning objectives, will identify for the learner, as well as for himself, the kind of activity that will be accepted as evidence of achievement. Further he points out that defining of specific objectives helps both teacher and learner select relevant subject content as well as serve as a good basis for selecting educational materials, he claims:

... you cannot concern yourself with the problem of selecting the most efficient route to your destination until you know what your destination is (1962, p. 1).

The defining of terminal objectives and the blind adherence to them can lead to two educationally undesirable outcomes which are contrary to the 'education as initiation' concept. The first is the



possibility that such objectives may fall short of the student's capabilities and may actually restrict his development. Theoretically, this should never happen, since in establishing educational objectives, the learners' potential should first be assessed and established. Given the constraints and limitations of actual classroom conditions, however, it becomes highly unlikely that such assessment for every topic and student is practical, or even possible. The second undesirable outcome, lies in the possibility of underestimating or even misinterpreting the educational value and impact of learning activities. As Mitchell has shown, "not all educational aims or desired changes in a student's capability --his capacity to behave-- are amenable to such precise analysis, instructional regulation or even observation" (1972a, p. 1). While accepting the desirability of establishing objectives, Mitchell's caution about the value of expressing all objectives as overt behaviour, should certainly be heeded especially if the learner is to be encouraged to embark on educational experiences related more to the growth than to the skill end of the educational spectrum.

### Analysis

Once the teacher defines learning objectives, he has to establish whether the learners' capabilities are equal to the demands made on them. As Suppes (1964) claims and as many teachers can corroborate, although classroom and laboratory studies are constant reminders that individual differences in students is one of the most important principles of both learning theory and subject matter teaching, it has been the least accepted. In instructional situations where the stress shifts from teaching to learning the individual's learning ability and

his disposition towards the set objectives are essential.

Glaser (1971, p. 25) identifies four determinants in analysing pre-learning activity: (a) the extent to which the individual already has acquired the response sought, e.g. the appropriate motor skills; (b) the extent to which the individual has acquired the pre-requisites for learning the responses to be acquired, e.g. knowing how to add before learning how to multiply; (c) the extent to which the individual has acquired the learning-set variables consisting of antecedent learning which facilitate or interfere with new learning e.g. prior experience or information in a particular area; and (d) the individual's ability to make the discriminations necessary to profit from instruction, e.g. aptitude from spatial perception.

Experienced teachers tend to perform this analysis intuitively. However, in the traditional teaching-learning situation such analysis tends to be undertaken only in a general manner and for the class as a whole rather than in relationship to the individual learner's capabilities and needs. In the development of instructional design such practices are no longer tenable. As Glaser points out, "the diagnosis of the learner's strengths and weaknesses prior to instruction for appropriate pedagogical guidance will become a more definitive process so that it can aid in the design of a curriculum specially suited for the student involved" (1971, p. 37).

### Instruction

Having established the desired objective and the student's position vis-a-vis that objective, the teacher must design the kind of

instructional experience, and the stimulus materials that most effectively assist the learner to reach the desired objective. Here the teacher's training and experience in educational psychology, principles of education, and methodology, as well as knowledge of the capabilities and limitations of educational materials help him design the type of instruction that fits most appropriately the stated objectives. Recent work by Gagne in distinguishing between seven categories of learning (1969) namely: S-R Connections, Discriminations, Motor Chains, Verbal Chains, Concepts, Principles, and Strategies; and his analysis of the instructional processes in eight conditions of learning (1965, 1971) namely: Gaining and Controlling Attention, Presenting the Stimuli for Learning, Informing the Learner of the Required Performance, Recalling Previously Learnt Capabilities, Guidance of Learning, Providing Feedback, and Promoting Transfer of Learning. These works together with Rominiszowski's classification of instructional methods and media (1968, 1970), provide theoretical guidelines for designing the most suitable instructional process.

### Evaluation

The evaluation stage in an instructional design is an essential one. Glaser (1965a) points out very strongly that the performance of the students needs to be measured since such measurements indicate the degree of auxiliary and terminal behaviours attained. Since many teachers are familiar only with paper tests they regard evaluation as narrowing and confining to the instructional effort and assume that it directs the teacher's and student's attention towards trivia (Geis, 1970, p. 24). Mager (1962, p. 4) combines the two arguments and maintains that tests

and examinations, when properly regarded and administered by teachers and students alike, are the mileposts along the road of learning and should tell the student and the teacher the degree to which both have been successful in achieving their set objectives. He adds that unless goals are firmly and clearly fixed in the minds of both parties, tests are at best misleading; at worst, irrelevant, unfair or useless.

In systematic instructional design, the above hazards are avoided. When specific behavioural objectives are stated it becomes possible to evaluate the student's performance with the stated objectives. This type of evaluation is an important departure from the traditional examination since it is not based on the relative achievement of one individual to another's. Evaluation in instructional design is based on the student's behaviour compared to the stated objective and his entering behaviour. A point stressed by Merrill is relevant here. A good instructional design does not have a large section of one-way presentation followed by an extensive testing situation. He writes:

A good design continually assesses the student's ability to perform the behaviours being taught and informs the student concerning his progress (1971, p. 372).

An important role of evaluation, in instructional design, is the part it plays as a feedback mechanism to test the validity and quality of the stated objectives, the analysis process and the instructional techniques adopted. Research and development in curriculum and methodology reform cannot proceed without valid and accurate evaluation. It will be the responsibility of an educational technology policy to provide for the analytic and systematic process

of establishing, conducting and evaluating such research and development in curriculum and methodology reform programmes that are best conducive to the "education as initiation" concept as developed in this chapter. Accordingly the development and dissemination of educational materials will play a major role in implementing such a policy.

## CHAPTER VII

### THE EXTENSION AND IMPROVEMENT OF LEARNING THROUGH THE USE OF EDUCATIONAL MATERIALS

Students are able to learn simply by listening to their teacher, by talking to each other, by interplay with their environment; the use of educational materials (including books) is not essential for all types of learning. Many social customs, traditions and folklore are passed on from generation to generation by observation, imitation, and word of mouth. "Sensitivity training" rarely incorporates educational materials, except for the immediate surroundings, which often consists of other people in a bare room. However, an educational system that seriously seeks the best utilization of resources to extend educational opportunities, and contemplates curriculum development and methodology reform to improve the quality of education, cannot do so without paying due regard to educational materials. Indeed, many of the advanced methods of learning and instruction discussed in the previous chapter cannot be realised without the extensive incorporation of educational materials; some of which can be complex and expensive, while others can be as common place as ordinary typed paper. For example, one cannot consider the selection of programmed learning as an instructional method, whether it consists of a programmed linear pamphlet or open-ended computer assistance, without taking into account the type of programmed-text, format, means of presentation, validation procedures, and the relationships between

the test population and one's students. Similarly, one cannot contemplate self-instruction in formal education without planning for and validating resource materials, storage, and provisions for a retrieval system. One cannot consider mass educational projects without planning for the media of distribution and accompanying material required.

The previous chapter dealt mainly with intellectual aspects of educational technology; this one considers the mechanical aspects, always keeping in mind that the two aspects cannot be easily separated, that dealing with one aspect immediately implies involvement with the other. Thus in discussing the role of educational materials in the educational technology policy for Malta, educational materials will be regarded as more than the mere "tools" which the teacher and student use to reach their learning objectives.

In this context, the user of educational materials becomes primarily concerned with the facilitation and improvement of teaching and learning, rather than with the arbitrary increase in utilization of equipment.

The difference is significant, for much of the potential effectiveness of educational materials, particularly audio-visual aids, has been impaired when this distinction was not made. Moller (1970, p. 35) points out, for example, that audio-visual enthusiasts often become overconcerned with the hardware and forget that the stress should lay not on the tools but how effective they can be in reaching a specifically defined objective. On the same theme, Gagne writes:

The magnitude of educational change does not seem closely related to the size of the hardware used. Sometimes a very small kind of hardware, or even a small kind of software, can bring about far more profound and far more desirable effects than can the installation of big hardware. Perhaps the major reason for this is that the individual student, the learner, is the focus for change. Whatever large installation one may think about the difference is going to be made where the student is (1968, p. 4).

Gagne goes on to give examples of small and inexpensive educational materials (such as a programmed text) proved, on occasion, more effective than an expensive computer based teaching programme. This argument should be noted by people who dismiss proposals to increase educational materials utilization on the premise that the educational system cannot afford costly --albeit effective-- teaching aids. Educational materials need not be costly; and high cost materials need not imply more effectiveness than less costly ones.

Effectiveness should be the main criteria for the selection and use of educational materials. An educational technology policy would adapt Zigerell's advice on educational television utilization to all educational material use. He writes:

A faculty or administration thinking of introducing T.V. into the instructional program of a college should do so only after identifying the ends, or needs that can best be served by T.V. Too often, as all of us know, administrators and T.V. specialists, bemused by the magic of the technology itself and buoyed by funds from a variety of sources, have eagerly bought equipment and built studios without attempting to tie T.V. to the school's total educational program, or without attempting to determine the real needs to be served, if any (1969, p. 73).

Equally important, such advice applies to the use of human resources. The alternative restricts the teacher's potential and renders him a mere purveyor of information instead of the professional



initiator and manager of learning. Consequently, it is essential to link further discussion on the use of educational materials in Malta with the objectives of the educational technology policy which, it will be recalled, is concerned with the greater effectiveness and the greater efficiency of the Islands' educational system.

### Educational Materials and the Extension of Educational Opportunities

With the introduction and re-organization of the "Secondary Education for All" scheme, the general educational opportunities at primary and secondary levels are reasonably well catered for. However, as Cameron (1970, pp. 17-18) points out, while the Department has a surplus of regular teachers, it has a shortage of teachers in certain specialized subjects, particularly in science and technically oriented fields. This shortage becomes apparent at the secondary level; it takes an acute form at the higher and further education levels.

Since the Department employs a surplus of teachers in other areas, the most obvious solution to the shortage of specialized teachers, would be to retrain personnel for the short-staffed areas, a scheme which the Department has already initiated. However, the retraining of teachers in specialized subjects would serve only as a partial solution. In the first instance such training takes considerable time (when the need is immediate) and assumes that non-specialists have the potential to become such. Secondly, because specialized teaching, (particularly in the vocational and higher education technical fields), requires special facilities and expensive equipment utilized by a relatively

small number of students, the cost of duplication of such equipment in various locations becomes prohibitive. Consequently, an educational technology policy considers as a more viable short-term solution the more effective utilization of the services of existing specialists and other available resources. For instance, it may be possible to aid regular teachers through the mass or individualized recorded media, until more specialized teachers and resources are available. On a long term basis, the Department would develop resource materials for individual tuition and establish regional or central workshop areas which students would utilize by appointment.

Furthermore, retraining teachers in specialized subjects to extend educational opportunities on the conventional pattern, does not necessarily mean that people who desire or require such opportunities will be willing to make use of them. This doubt becomes most significant at the vocational and continuing education levels where circumstances and attitudes are known to act as decisive impediments. For example, research connected with Germany's Telekolleg (Schardts et al., 1970) shows that over fifty percent of the programme's participants could have availed themselves of the existing conventional schooling provided by the Berufsaufbauschule system, whose curriculum Telekolleg followed. Further research indicates that Telekolleg participants selected the new mode of instruction through television, correspondence and a weekly in-class session, not only because it was more convenient in physical terms, but also because many of the adult participants preferred to follow lessons on their own rather than attend conventional type classes. Taby (1966) reports similar experiences in Czechoslovakia,

while Coles (1969) and Kidd (1970) report parallel incidents from their international research in this area of education.

It is reasonable to assume that while the retraining of surplus teachers may ameliorate the current shortage of specialists, such a measure by itself will not solve those problems encountered in vocational and continuing education. It will not overcome difficulties faced by potential students unable to attend school on a regular basis or who are forced to travel considerable distances to a training centre. Nor will it overcome the attitudinal obstacle which discourages adults from attending school environments normally associated with younger learners. The educational system in Malta will have to contend with these problems as the need for job mobility and Education Permanente becomes mandatory when the Islands' economic diversification accelerates.

In its efforts to help Malta extend educational opportunities the educational technology policy will take into account the above points and consider the utilization of educational materials to solve them. For example, it will consider both the mass broadcasting and print media, and the use of individualized programmed instruction to make available to a large number of students the expert instruction of specialized teachers. Mediated instruction will diffuse aspects of the instructional process which pertain simply to the provision of information and demonstration, and free the regular teacher, classroom time and even laboratory space for those aspects that do require personal attendance and individual assistance.

Enough documented evidence exists to demonstrate that effective utilization of educational materials can provide the services mentioned

above (Thornton and Brown, 1968). Self-instructional materials, for example, have been used and validated in such varied subjects as regular teacher-training in Algeria, (Lyle, 1967); biology laboratory work (Postlethwait, 1968); experimental psychology (Lloyd and Knutzen, 1969); counselling (Tansey and Unwin, 1969); as well as developing self-instructional packages for teacher-trainees by the author (Farrugia, 1971). Similarly favourable reports from several countries with different educational problems support the integration of all educational materials with appropriate media for dissemination. The British Open University (Pentz, 1969), East Germany's Television Academy (Paulu, 1969), and Chicago's T.V. College (Gaudray, 1970) are three well known examples of attempts to extend higher education opportunities. The Japanese Broadcast Correspondence Schools (Robinson, 1969), the already mentioned German Telekolleg (Scharlts, et al., 1970), and Italy's Telescuola (Tovaglia, 1961) are similar examples at secondary school level. Sesame Street (Ball and Bogatz, 1970) and the American Samoa E.T.V. projects (Schramm et al. 1967c) are further examples of how educational materials can be used effectively to meet specific educational demands at primary school level. The Multi-Media Projects (as a follow up of TEVEC) in Quebec (Allnutt, 1972), and Radio Rural Forum in India (Schramm et al., 1967b) are other examples of combined use of educational resources, including well-trained teachers and animateurs, in community developed projects. Recent reports from the U.S.S.R. (Tebbel, 1972) indicate that the educational authorities there are currently developing similar programmes in the whole spectrum of the educational system. Multi-media projects, with special emphasis on educational television, are used to provide instruction from

kindergarten to adult education, from refresher courses in medicine and electronics to cultural and enrichment programmes.

In comparison, Malta's use of educational materials is extremely limited. Reference has already been made to the limited and peripheral use of even the "old" educational materials (except for books and the chalk-boards), while the use of "new" materials is almost non-existent (Lewis, 1967). For example, educational radio broadcasts are directed only at primary school level, educational television for just three subjects at secondary school level; neither are used for higher or further education. Filmstrips are used in a very limited way in primary schools, and hardly at all in the secondary; films are rarely used in either; while the use of programmed self-instructional materials is non-existent. As indicated earlier costs need not be prohibitive: failure to make wise use of educational materials could prove ultimately to be more costly.

The educational technology policy will aim at rectifying this situation so that, once educational objectives are established and specific problems identified, the Department can utilize validated educational materials that are most likely to help it extend educational opportunities. At the same time it will seek ways of improving conventional schooling.

Research and development work in one area need not preclude or restrict exploration in another; indeed one should reinforce the other. For example, educational materials developed for classroom use, can be modified and adapted for radio and television broadcasting; conversely broadcast material can be modified for use in the classroom.

Both can be adapted and incorporated into self-instructional packages and made available in schools, public libraries, resource centres and possibly for individual use at home.

At this point it should be re-stressed that the underlying point in the utilization of educational materials to comply with the educational technology policy is not a blind acceptance of their potential contribution. While due consideration will be paid to their proven contribution in solving problems in other countries, the criteria for adoption of a particular mode of instruction using one or a combination of educational materials must be its validated ability to meet specified needs of the Maltese educational system.

#### Educational Materials to Facilitate

##### Teaching and Learning

The second major function of educational materials in an educational technology policy will be to help the Maltese educational system upgrade the quality of existing educational opportunities. It will attempt to make educators aware of and able to utilize and benefit from, the contribution that educational materials can make to the improvement of teaching and learning.

Through training teachers will become aware of the presentational values of educational materials. They will be encouraged to utilize validated multi-media which are more likely to enable students understand concepts, develop attitudes or master skills better than "chalk and talk" methods. At the same time, users of educational materials will become aware that presentational attributes by

themselves play only a small part in facilitating learning. Hoban (1968), for instance, feels that the instructional efficiency of educational materials derives not so much from the media themselves as from the effective use of psychological principles of teaching and learning incorporated into their utilization. (This point will be dealt with fully in Chapter IX in the discussion on teacher-training).

In developing the right attitudes towards the use of educational materials teachers will not regard them as pipelines through which information flows into the passive learner. Consequently they will become less concerned with presentational techniques and efficient operation of equipment and more with the extent to which educational materials improve instruction. Babin (1970, pp. 9-11), for example, regards mis-users of educational materials as the antithesis of initiators of learning, since in imitating advertising and propaganda techniques, they tend to dominate rather than liberate their students from the confines of traditional schooling. The educational technology policy therefore, considers the mis-use of educational materials as educationally worthless, if not unethical.

#### Improving Lessons Design

Teachers will also be encouraged to utilize educational materials in their classrooms since such use tends to produce improved lesson design even when lessons are conventional. For example, pre-prepared educational materials can be of better quality and clarity than hastily constructed or improvised materials. They make available to the teacher instructional content that is frequently difficult or impossible to provide under classroom conditions. In pedagogical and practical

terms, this advantage means that pre-prepared lesson materials present the learner with more accurate information while providing the teacher with high quality, accurate material which he can use on several occasions. Furthermore, without inordinate extra work, the teacher can convert classroom materials into self-instructional packages which students can use on their own.

Such claims are widely supported. MacKenzie et al. (1970, p. 75) state that it is a matter of common observation in higher education that the use of educational materials tends to add clarity and precision to the way the lesson content is presented. They suggest that the mere discipline of seeking out, or preparing for oneself materials that are suitable for one's course adds to its educational effectiveness. Vriend observes that due to the use of educational materials, "lesson design has inevitably become more precise, more realistic, more highly specified, and as a consequence, probably more effective" (n.d., n.p.). Furthermore, Schramm et al. (1967a, p. 79), evaluating the use of new media in educational systems, claim that the resultant improvement in lesson design produced by the use of educational materials becomes noticeable not only among educators producing mediated lessons but also among those who use them in the classroom. Similar claims are made by Schardt et al. (1970, p. 39-40) in evaluating the side effect of Telekolleg; teachers who followed the well organized presented television lessons improved their own lessons in attempts to emulate the television programmes. The author's own experience in training teachers to prepare lessons both for the conventional classroom and for broadcasting concurs with the foregoing.



Unfortunately some educators misunderstand the function of educational materials when they attempt to imitate the commercial and entertainment use of the mass media of communication. While recognizing the value of the potential value of the mass media (whether they are television, radio, newspapers, magazines, comics, films etc), the educational technology policy will discourage teachers from becoming poor imitators of the commercial mass media with their often poor or non-existent educational content. Himmelweit (1958, p. 361) studying the effectiveness of television on young British viewers, points out that, since the aim of commercial broadcasting is entertainment and not formal education, such programmes are designed for passive viewing and not to stimulate the audience towards educational activities. Consequently, she concludes that any educational benefits that may emerge from the commercial mass media, are haphazard.

Furthermore, even if the above mentioned hazards are avoided and educational materials are used to improve lesson design, this does not necessarily guarantee students' motivation for learning. As Gagne (1969, pp. 100-110) has explained, educational materials can enhance what he identifies as the eight conditions of learning, however the mere utilization of educational materials, cannot ensure the fulfillment of all or any of them. The student's motivation to learn can render the use of educational materials valuable or useless. Concurrently, the ability of educational materials to motivate and enable the student to learn renders their contribution valuable or trivial.

Regarded in this manner, the possible value of educational materials takes on a far wider significance, since it goes beyond

intrinsic representational values to include extrinsic motivational values of encouraging the student to attain his educational goal. In this context, a historical film about ancient Greece need not be a means of illustration. Rather it may be used for example, to encourage the student to find out more about the influence of Greece on our culture; to generate discussion and debate on the concept of democracy, freedom or education; or simply as a means of rewarding the students for work well done. Furthermore, the use of educational materials to motivate, when incorporated with their presentational attributes, becomes of significant importance in the development of self-instructional activities. Educational materials can relieve the teacher from imparting much of the basic skills and content and allow him valuable time for helping, guiding and inspiring the individual student.

#### Learning Through Creating Educational Materials

Up to this point, the discussion has dealt with educational materials as a means of supporting and improving the traditional type of teaching situation where the learner is at the receiving end, albeit not passively; where he is interacting with educational materials. Educational materials take a greater dimension when the learner creates or produces materials as an integral function of the learning process (Goldiamond, 1968; Moller, 1970; Mitchell, 1971d; Burton, n.d. a,b).

As the scientist constructs, develops and improves his laboratory equipment and materials until he can draw a definite conclusion; as the poet experiments with words and meters to the point of reaching personal satisfaction, so can the student utilize educational materials creatively to explore a subject and, in the

process, to learn about it. Thus, this author has watched four-year olds play with candies or blocks to discover that five and five make ten; to discover that they could alter the shape of a "B" into "P" and "R". Similarly, he has had primary and secondary school pupils, working individually or in groups, collect or take pictures, hold tape-recorded interviews, write articles, produce "classroom newspaper" and school news programmes in the process of learning about "Our Village". In the same manner, he has worked with a group of second year student-teachers to prepare a radio-vision production of "Mdina - Malta's Ancient Capital", a series of socio-religious educational radio and television broadcasts, and an Algebra programmed-text. These activities serve not just as a means of mastering content but, primarily, as a means of discovering the potentialities, advantages and limitations of using such materials.

The educational technology policy encourages the use of educational materials not simply for their presentational and organizational values; more importantly, it encourages and will facilitate their use in order to enable students (and teachers) become what Mitchell calls the Student Learning Materials Developer. In the process of becoming a fully functioning, self-educating person:

... each student must develop a capability to bring to bear upon educational problems not only the problem solving skills of a practitioner of educational technology but also the necessary conceptual background and skills pertaining to the subject matter in question and, indeed, relevant knowledge and skills in a variety of disciplines. In addition he must learn to identify valuable objectives and establish priorities among them in regard to the allocation of his own time or other resources. And he can be expected to discover how to estimate the possible consequences of his behaviour in specific circumstances which are problematic and to select or generate alternative means to achieve his goals. In short, the student participant should undergo a profound growth phase, one which should prepare him for self-regulated education ... (1971d, pp. 10-11).

It must be stressed once again that such practices do not necessarily require elaborate or expensive equipment. Many student teachers in Malta prove this each year during Teaching Practice when their pupils "conduct" lessons, demonstrate, discuss and defend the products of their group projects. In the process, their pupils collect objects, cut out pictures, use flannelgraphs, filmstrips and three dimensional models. With the student teacher's co-ordination and direction, pupils research, draw, write and build educational materials which will help them reach an educational goal. These activities do not require materials or equipment beyond what is normally available in the school. Naturally, the availability of basic equipment is important; of greater importance, however, is the teacher's attitude and his comprehension of the role of educational materials. The educational technology policy for Malta should develop appropriate attitudes as well as make available the right quality and quantity of educational materials in the schools.

#### Educational Materials and the Mass Media

This subject, touched on earlier, needs further clarification. While it is hazardous for the users of educational materials to imitate blindly the commercial use of the mass media of communication, it is equally hazardous to ignore its effect on people through cognitive dissonance.<sup>1</sup> Many teachers, perhaps feeling threatened by the mass media,

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<sup>1</sup>Leon Festinger (1957) developed A Theory of Cognitive Dissonance to explain the phenomenon in which people threatened by physical or psychological unpleasantness ignore facts and defend blindly their irrational stance.

react so strongly against them to the point of rejection. To ignore the mass media and their potential effect on education is not simply to ignore a powerful force that influences people's lives, but also constitutes a dangerous attitude of ignoring a powerful competitor, which properly harnessed has the potential of becoming a powerful ally. For example, discussing the effects of television T. S. Allan (1971) sometime Head of the B.B.C. Schools Broadcasts (Scotland), likens the educator who ignores it as a major communication medium to the transport manager of a large city trying to ignore the automobile. Halloran (1964, pp. 11-15) in a survey studying The Effects of Mass Communication shows that the mass media are affecting all aspects of our life: leisure, work, culture, social relationships, home life and education. Coldevin's (1971) research into the factors that influence high school students' attitudes towards national and international issues indicates that the mass media, particularly television programmes are the dominant variables. The school, family and church which generally have been regarded as the most influential agents, took second, third and fourth place to television.

As noted earlier, the educational value in the content of the commercial mass media tends to be haphazard. However, the media still are major sources of information dissemination. Although no statistical evidence is available in Malta, it is a general observation that children entering school now start from a different vantage point than their counterparts did ten years ago. Current children's knowledge of the world around them is not limited to what their own town, village or home presents to them. Through the mass media, the great majority of them will have seen and heard ships entering harbours, aircraft

taking off, soldiers fighting in far-off lands, and children who dress and live differently from ourselves. Concurrently with adult audiences they will have heard about revolutions, elections, and sporting events from locations thousands of miles away; they will have seen man's weightlessness in space, astronauts landing on, walking on and returning from the moon. At five, they may understand very little about all this, but what they have heard becomes part of their world: sometimes it complements, sometimes it competes with, sometimes it conflicts with what they hear and see at school.

Instead of ignoring or attempting to fight the impact of the mass media of communication, the educational technology policy for Malta attempts to utilize the knowledge pupils acquired outside the school as a springboard for more meaningful and planned activities within the school. The alternative, as McLuhan succinctly points out, will be the wider split between the intra-mural and extra-mural school environments. He writes:

It is a matter of the greatest urgency that our educational institutions realize that we now have civil war among these environments created by media other than the printed word. The classroom is now in a vital struggle for survival with the immensely persuasive "outside" world created by new information media (1967, n.p.).

In attempting to avoid such a "civil war", the educational technology policy seeks ways of co-operation amongst the appropriate bodies in the Islands to improve general as well as educational broadcasting. At the same time, it will undertake to train teachers to incorporate the benefits of the commercial media programming in formal instruction, so that in the words of the authors of The New Media: Memo to

Educational Planners:

[Educational materials] should change the previous [instructional] pattern and become a new and integral component of a new or modified total teaching-training system, whose purpose is clear and whose various components are well integrated and mutually reinforced (Schramm et al., 1967a, p. 159).

In concluding this chapter it must be re-stressed that the presentational and organizational attributes of educational materials become significant and valuable when linked with the instructional practices that are designed to ensure the proper utilization and validity of the entire instructional processes. Thus the educational technology policy in accordance with the principles established earlier, encourages the use of educational materials in "programmed" form,<sup>2</sup> where the educational technologist, who functions as educational materials specialist or programmer incorporates the presentational and organizational contributions of educational materials in the developmental process of programmed instruction. This practice ensures that programmed instruction can be presented more effectively through a variety of educational materials and, equally, that educational materials become more effective when used in systematic and validated instruction.

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<sup>2</sup>In this context, programmed instruction, should not be regarded in its narrow application to the "teaching machine", or a quaint booklet, rather it is the developmental process that leads to the effective and validated presentation of learning materials of all kinds.

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omitted in page numbering.



PART THREE  
IMPLEMENTATION OF THE  
EDUCATIONAL TECHNOLOGY POLICY

## INTRODUCTION

The implementation of the educational technology policy for Malta will require the acceptance and support of its proposed beneficiaries: namely the teachers and students on one hand, and the educational administration on the other. The teachers and students will need to recognize the value of such a policy, to accept it and to be able to operate within its constraints. The educational authorities will also have to recognize the value of and the need for such a policy; then, they must create the administrative body and logistical framework within which such a policy would be executed.

Part Three of this work deals with both aspects in the realization of educational technology policy for Malta, namely teacher-training in educational technology and the role of a Malta Educational Technology Centre.

## CHAPTER VIII

### TOWARDS A PROFESSION OF EDUCATION

The demands made on an educational system as a whole are encountered in microcosm by the teacher in the classroom. He has to deal with an increasing amount of knowledge in an increasing number of subjects for numerous students with an increasing number of heterogeneous interests. Frieder has described the problems of today's teacher quite succinctly by comparing him to Socrates. He writes:

The students of Socrates learned by listening to Socrates, listening to their peers, and by looking at various scrolls. Students today learn by listening to their Socrates (but usually sans the Socratic method), listening to their peers, and looking at various scrolls. There is really only one difference. Socrates was asked to do too much for too few, while today's teacher is asked to do too much for too many (1970, p. 28).

The teacher is expected to be the students' guardian, councillor and friend. He is also expected to keep up with the literature, develop new curricula, experiment with new pedagogical techniques, as well as create new, stimulating and effective instructional environments. The teacher is often required to achieve all this with a one or two year training course completed many years ago. Even graduates fresh from teacher-training colleges, points out Merrill (1971, p. 56), do not necessarily possess the requisite capabilities to cope with the demands made on contemporary teachers. This ineptness becomes a serious impediment in any attempt to improve the efficiency of an

educational system, since future improvements in education depend on the competence and aptitudes of the teacher, who will continue to be one of the most important factors influencing the nature and quality of formal education.

Reorganization of the educational system through planning, innovations in curricula and pedagogy, development of educational materials, reorganization of the classroom environment and the assignment of different functions to the teacher whether as initiator of learning, manager of resources, or member of a team-teaching group, will be only as effective as the teacher has been trained to function within the new structure. Lindsey (1966) points out that an ungraded class will have no advantage, unless knowledgeable and skilled teachers capitalize on its unique features. A physical plant that has learning centres, individual carrels, television facilities and computer-terminals will be able to contribute to better quality learning only if its teachers are prepared to take proper advantages of these materials. Curriculum changes will be implemented and tested in the schools only as teachers are able and willing to do so.

Consequently an educational technology policy for Malta will become effective only if teachers are able to understand its implications, come to appreciate its need and effectiveness, and are capable of performing within its requirements. The Colleges of Education in Malta will be expected to play a prominent part in developing among teachers aptitudes, appreciation and required abilities to make effective the educational innovations introduced by the educational technology policy.

Teacher-Training for Professionalism

It is to the advantage of the educational system that the Colleges of Education in Malta are among the most progressive bodies in the system. They continually seek better ways of training their students and readily support promising educational innovations.

In spite of an enlightened approach towards educational innovations and the fact that teacher education courses at the Malta Colleges of Education have evolved and improved they have not progressed beyond survey-type courses that serve as a general introduction to basic educational psychology, methodology, or the principles of education. In this respect the Malta Colleges are no worse than most (cf. Merrill, 1971, p. 56); in other respects they are better than many, especially where they stress the need to adopt new teaching methods (particularly in New Mathematics and in developing centre-of-interest type lessons). In the past, they were heavily handicapped by the need to improve the general academic standards of their students, by the shortage of staff, and especially, by the short duration of a two-year course. These shortcomings have now been overcome, and the recent introduction of a three year course provides an excellent opportunity to establish a more profound and professional teacher-training programme. The establishment of a School of Education, which the Ministry of Education and the University of Malta are presently debating, should make a major contribution towards this goal.

A point that this work has stressed repeatedly is the concern of the educational technologist with intellectual processes in the development of educational practices based on empirically validated

results. This approach is singularly different from what Merrill (1971, p. 56) calls the "rule of thumb" approach of traditional pedagogy; or "the practice of common sense" approach which some "experienced" teachers call their theory-based practices. Kerlinger (1964) has delineated the difference between the "scientific" and the "common sense" approaches to tackling problems. He shows that while science and common sense are alike in that "science is the systematic and controlled extension of common sense," the reverse is not true. Kerlinger proceeds to show how the two approaches differ. Those who employ the common sense approach use theories and concepts loosely, testing their hypothesis by selecting evidence to support it regardless of how casual, fortuitous or extraneous the evidence may be. Consequently, such common sense might lead some to conclude that: sickness is the inevitable outcome of sin; young men with long hair are troublemakers; or little Johnnie does not learn because he is inattentive, careless, and consequently stupid. By comparison the scientist systematically builds his theoretical structures, tests them for internal consistency and subjects them to empirical testing. Thus after systematic searching the scientist may conclude that Johnnie appears inattentive not because he is stupid or careless, but because, for example, the type of instruction he is subjected to is quite inadequate; alternatively he might conclude that Johnnie does have learning, perceptual, or other problems, and requires special treatment.

So far educational practices --and teacher training programmes-- have been based more on the "common sense" type arguments than on scientifically-based techniques, with the result that educational practices have often been referred to as "a cottage industry". Yet

Saettler (1967, pp. 133-134) has argued that to have any real effect on the future advancement of education, teacher-training colleges need to exchange their present theoretical-deductive methods for the empirical-inductive. Teacher-training courses should engage their students in more exercises designed to depict effective instructional methods. Furthermore, the training colleges (and the University's School of Education, when established) should be searching for other methods that work more effectively.

Rowntree argues that the teacher can follow the techniques of the scientist by establishing hypothesis-testing procedures. "The teacher," he writes, "can now act like the scientist who first identifies his problem then comes up with the hypothesis to explain it, and finally performs an experiment that allows him to accept that hypothesis or reject it in favour of an alternative" (1969, p. 11). He goes on to explain that the teacher's problem is how to get certain pupils to their objective, and his hypothesis consists of a certain lesson or course that will help them reach their objective. The teacher carries out experiments by actually trying out the lesson and checking whether it has in fact enabled the pupils to reach their goal, --presuming of course that progress toward the objective can be immediately observed (cf. Mitchell, 1972a). The real value of this approach is the validation of the lesson, so that it is accepted and put into regular use only if it meets a prescribed criterion of effectiveness. Otherwise, the lesson will be rejected or revised and tried again until it becomes effective. The scientific, professional approach to education, often associated with systems analysis and instructional design (see Chapter VI) is a reversal from the traditional approach

which assumes that if pupils fail to learn, they are at fault, not the instructional system.

Teacher-training that aspires to professionalism would stress the scientific approach of educational technology derived from good and validated teaching practices. Macdonald (1970) has argued that in a technologically oriented and highly skeptical world, the teacher can best justify his important role in society by developing professional practices that provide consistently reliable results, instead of following unclear and fuzzy instructional practices that may or may not lead to the desired outcome. It has been argued that such developments towards a professionalism in education are desirable if the teacher is to retain the respect due to the work he performs. Furthermore, professionalism in education becomes mandatory if the confusion among teaching and learning theories is to be cleared up (Platt, 1964; Sheehan, 1967; Rowntree, 1969; McKenzie et al., 1970; Macdonald, 1970; Merrill, 1971).

Systems analysis or instructional design approaches to education make it possible to raise the educator's work to a professional quality. By adopting practices which many good teachers have discovered intuitively, and validating them through the rigorous application of science and technology, one heightens the likelihood of success in reaching the desired goal. Thus in Rowntree's words, all teaching will become:



"programmed" --at least in the sense that it is capable of being empirically tested and improved. (Non-testable "teaching" may be reclassified as "entertainment"). Such "systems" teaching, if well documented, could generate learning theories that are consistent, reliable and applicable to the instigation of new practices. And, being able to explain his activities in terms of predictable outcomes and tested theories, that can be built on by others, the teacher would raise himself at last from craft to professional status. If technology is the application of science to art, then educational technology may give us the power to develop the art of education into an applied science (like medicine or architecture, perhaps) in which each new generation of practitioners becomes more effective than the last (1969, p. 13).

The ability to apply systems analysis and instructional design techniques to courses and lessons, together with stronger courses in educational psychology, methodology and principles of education, will provide the professional grounding of teacher training compatible with the requirements of an educational technology policy. This grounding will help teachers assess the priorities of the learning system as well as respond to and operate within new learning theories, new curricula, new educational materials. When the teacher has undergone such training, he will not engage in novel ways of instruction (such as team-teaching, developing or using self-instructional packages, using audio-visual aids, and introducing new curricula) just for the sake of innovation. Rather he will do so in so far as one or a combination of these techniques or materials is hypothesized as likely to fulfill his purpose, namely to help his students reach an educational objective.

Furthermore, once a teacher trainee learns to design and validate his own lessons he becomes more capable of adapting and changing with the exigencies of the school system. Peters (1966, p. 93) points out that today's teacher cannot be initiated, by an apprenticeship

system, into established traditions with prescribed and standard methods of teaching or preconceived attitudes towards learners. Such a system was possible only in times when social change was negligible. He points out that because of constant change and the disagreement among educators themselves on what procedures and content the teacher should follow, today's teacher has no alternative but to think these out for himself. Consequently, one must conclude that if the teacher is to help his students become capable of facing and adapting to change, he himself must be trained to do likewise. Allen and Mackin (1970) suggest that the ultimate effort of teacher education programmes should be to prepare teachers to be flexible, creative and innovative; and, one might add, to help their students to be flexible, creative and innovative too.

In view of the foregoing, an educational technology policy for Malta will become most effective when the teacher training colleges adopt the rigorous application of scientific methodology, and train their students to operate within it. Once given this professional grounding, future teachers will be able to improvise and confidently operate within the context of independence which schools are beginning to foster. They will be sensitive and responsive to the needs of students who will view teachers increasingly more as facilitators of learning rather than as purveyors of knowledge.

The "professional teacher" will be in control of all the instructional variables. He need not suffer from the anxiety found among those teachers, who though they may appreciate the need for innovation and may recognize the value of educational technology, nonetheless, have an uneasy feeling that technology is dehumanizing

education and turning the teacher into a button pusher (Wagner, 1967).<sup>1</sup> Instead of feeling threatened by the resources and the glamour of technology and new media the "professional teacher" will be able to incorporate the benefits of new techniques and materials in his instructional design. He will appreciate that new techniques and materials can provide him with the valuable and necessary time to humanize learning. Released from the need to teach much of the basic skills and content, he will find opportunities to lead discussions, raise challenging questions, diagnose content, work with individual students, confer with other teachers, plan courses, as well as find time to talk and listen to his pupils.

Teacher-training leading to a professionalism in education will prepare and train teachers to depart from traditional instructional approaches where the teacher is an information giver and the student a passive receiver. Instead, the professional teacher will be trained to perform several roles.

(1) According to instructional requirements he will become a teacher-manager who plans, organizes and leads the process of learning.

(2) As a teacher-researcher, sometimes he will formulate problems for the students, at other times he will identify their problems and help them reach a solution.

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<sup>1</sup>The fear that technology will deprive the teacher of his job, is not a twentieth century phenomenon. Blake and McPherson (1969) point out that teachers in the fifteenth century felt the same threats when the printing press was invented.

(3) As a facilitator of learning, he will look for, make available and advertise sources of information which the students can utilize.

(4) As a teacher-technologist he will regard new techniques and new educational materials not as his competitors trying to drive him out of a job but rather as part of the process that helps him and his students reach their instructional objectives.

Although Educational Technology may ultimately adapt, even change, the teacher's job, he should be able to manage this change making his own role more worthwhile and effective in promoting education. Educational Technology principles applied in teacher-training courses and aimed towards professionalism in education, will help future teachers function efficiently and effectively. Thus they will be able to follow Bruno Bettelheim's advice to people faced by the dynamic impact of technology:

... not to run from technology by destroying it and depriving oneself of its advantages, but to realize the dangers and meet them with the conscious action based on personal decision. This neutralizes the danger and lets us enjoy the advantages of technology without letting it deprive us of our humanity (1967, p. VII).

#### Educational Technology Courses at the

#### Malta Colleges of Education

Professionalism in education through the rigorous application of scientific methodology to solving applied problems should become the concern of the whole teacher-training programme. However, the Foundations in Education courses of the programme should become even more involved in the promotion and application of problem-solving, rather than survey-

type instruction. Educational Technology together with Psychology, Methodology, Curriculum Development, Philosophy and Social Aspects of Education, would form the core or foundations for professionalism in education.<sup>2</sup> Educational Technology courses will provide teachers with the rationale and ideology and with the theoretical and methodological basis of educational technology. They will enable students to apply Educational Technology in the systematic analysis and the design of instruction. The proposed courses will aim at overcoming what Beeby (1970, pp. 44-51) identifies as the two major obstacles to teachers' adoption of educational innovations, namely, (a) teacher's inability to appreciate the need and the scope of the innovation; and (b) their inability to implement the innovation.

The rest of this chapter proposes the structure of an Educational Technology General Course and an Educational Technology Specialists Course. In conjunction with the other teacher-training courses they should develop the appropriate attitudes and capabilities among teachers, to make the educational technology policy for Malta effective. The rationale for the provision of a General and a Specialist course will become apparent in the ensuing discussion.

#### Educational Technology General Course

Applying the empirical-inductive approach to solving applied problems, the General course will be based on three integrated areas

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<sup>2</sup>General and Specialist courses in Audio-Visual Media were initiated at the two Colleges of Education by the author in 1967; however these have been concerned mainly with providing the rationale for, and developing techniques in, the use of audio-visual materials (Farrugia, 1967), not the wider aspects of educational technology as developed in this work.

dealing with:

1. Aspects of Educational Technology,
2. Operational and Production Training,
3. Experimentation and Demonstration Sessions.

The Aspects of Educational Technology portion will deal with the theoretical and methodological foundations of educational technology. At the end of the course the student-teacher will be able to (1) identify and operate within the major principles of learning, (2) recognize the constraints of applying such principles both in classroom and extra-mural environments, (3) derive learning objectives from the curricula of the Maltese Educational System, (4) describe them in terms that will be meaningful to his pupils, (5) assess the entering behaviour of his pupils, (6) identify those environmental and social characteristics that will facilitate or hamper learning, (7) select and construct his instruction in the best manner that will help his pupils reach their goals, (8) evaluate his pupils' terminal behaviour and compare it with stated goals, (9) identify those factors in the instructional process which facilitate or hamper the pupils' progress, and modify them.

At the end of the course, the student-teacher will have become acquainted with and able to apply learning theories, human communication theories, audio-visual methods of presentation (including educational broadcasting), curriculum development, lesson design and validation techniques to instruction.

In the Operational and Production Training portion the student-teacher will be trained to operate educational materials that are available (or likely to become available) in and out-side, the colleges.

This part of the course will consist of laboratory sessions where the student will have the opportunity to catalogue and retrieve educational materials, operate apparatus, construct three dimensional aids, and produce educational materials ranging from simple visuals and tape-recorded programmes, to 8mm single concept films and self-instructional packages. At the end of the course, the student will be able to evaluate and compare the characteristics of the educational materials handled in order to select those that blend most fittingly in to his instructional design.

Both the predominantly theoretical Aspects of Educational Technology and the predominantly practical Operational and Production Training portions of the course will be integrated in the Experimentation and Demonstration Sessions: there, the two areas will be applied under actual or simulated instructional conditions. These sessions will provide students with opportunities to observe experienced teachers (or themselves) conducting lessons that are compatible with the principles of Educational Technology. Each student will have an opportunity to conduct or participate in instructional situations varying from the traditional lessons, to those that apply child-centred, team-teaching, programmed learning, self-instruction, group-centred, mediated, and gaming simulation approaches. He will be given an opportunity to set up experiments, validate techniques, as well as observe, note, discuss and draw conclusions on the learners' reactions to these approaches. At the end of the course, the student-teacher will be able to accept, modify or reject some of these approaches according to concepts, principles and techniques developed through the whole teacher-training programme. Once he graduates, the new

"professional" teacher will be expected to apply and develop these concepts, principles and techniques through his regular teaching duties in the schools.

It should be stressed that such a course will be complementary to the other Foundations in Education courses and certainly not an alternative to any of them. Indeed, it is assumed that many of the issues raised in this course will be covered in depth in other courses, as those issues that will be covered in depth by this course will be raised in its complementary courses.

#### Educational Technology Specialists Course

In previous years the Audio-Visual Media Specialist Course was designed for students who sought posts of special responsibility servicing the library and audio-visual aids facilities in the schools. It dealt comprehensively with selected issues concerning the use of audio-visual materials.

The proposed Specialist Course will be designed to serve both student-teachers and experienced teachers who plan to work in: the school resource and library services, the proposed Educational Technology Centre, educational broadcasting, the production of educational materials, or curriculum and methodology projects. Equally it can serve those who simply desire a deeper involvement in Educational Technology because they are interested in its implications for their general classroom teaching.

The roles of "media" specialists have been defined in various ways. For example, Meierhenry has described the "media" specialist



as the teacher who is able to keep up with the rapidly changing educational world, and "relate to the development and management of the whole broad spectrum of the communication and information sciences, including the full range of media and materials" (Gerlach, 1966, p. 193). Fleming regards the "media" specialist in a less generalized way. He identifies him as the teacher who has a dual specialization, one in educational media (production and/or use), and one in educational research and theory (learning and/or communication). He sees the "media" specialist as

a designer of educational media systems to fit schools of various sizes ...[types and...] learners. He would prescribe pictorial and verbal constituents in the furtherance of ... objectives .... He must know the educational attributes and technical possibilities of each medium ... (Gerlach, 1966, p. 194).

Recently, Mitchell, including the more comprehensive aspects of educational technology rather than the limited "media" role, has defined the different, though related, roles of educational technologists as those of (1) Educational Development Analyst, (2) Educational Planner, (3) Educational Systems Developer, (4) Educational Materials Developer, (5) Learning Resources Manager and (6) Learning Resources Specialist. A graduate of the Educational Technology Specialist Course will possess the abilities to function in the roles which Mitchell lists as the last three categories. He will be able

... to determine and conceive the broader aspects of the work in which he is involved as a consultant problem-solver and planner,

... to work closely with a client (student or teacher) who has a problem requiring assessment and prescription of an appropriate learning activity. [He] should be particularly skilled as an educational materials developer or educational systems developer because [he] might find it necessary to solve large-scale problems or to prepare [his] own materials (1971b, pp. 10-11).

Thus, besides a deeper grounding in the areas covered by the Educational Technology General Course, students who select Educational Technology as a Special subject will be trained to identify, analyse and prescribe for problems that schools or individual teachers might encounter in educational technology. They will have opportunities to develop, research and validate innovative instructional materials and methods. They will be able to design, develop, produce and test educational materials; as well as write and produce for educational broadcasting. They will be expected to advise schools on the acquisition and use of educational materials and on the development and maintenance of resource and production areas. As part of their training they will help in the work of the educational resource centres at the Colleges of Education, assist the Colleges' personnel to utilize educational materials available there, and help students engaged in the Operational and Production laboratory sessions of the General Course.

Educational Technology Specialists will be encouraged to select an area of concentration in educational technology. Thus, some will concentrate in educational radio and television, or radio-vision. Others will prefer to develop special techniques in the production of wall charts, graphic communications, self-instructional materials, multi-media packages, or academic games and simulation materials. Still others will concentrate on the allocation of resources, the management of library and resource centres, curriculum development, or book

production and printing techniques. Some students will concentrate in applying educational techniques to instruction aimed at learners who require special schooling whether it is remedial, adult, vocational, technical, or education for the handicapped.

Wherever possible, these Educational Technology Specialist-trainees will be given the opportunity to spend part of their training working in institutions that deal with their area of concentration. Once they graduate, the Educational Technology Specialists should form a continuous link between schools and the proposed Educational Technology Centre, through the activities delineated in later sections of this dissertation.

In conclusion, it is recognized that some of the objectives of the courses outlined above might not tally with philosophies and methods favoured by other members of the Colleges of Education. Such disparity is inevitable and desirable in vigorous and expanding educational institutions; it should not be discouraged in institutions devoted to educational research and innovations. For the same reasons, it is important to encourage and support those members of the staff and student-teachers who experiment with new pedagogical methods, since student-teachers cannot be expected to adopt advanced or new instructional methods, try new curricula, and make extensive use of educational materials during Teaching-Practice and their subsequent full-time employment in the schools, if the college lecturers themselves do not practice what they "teach".

It is also recognized that an educational technology policy leading towards the development of professionalism in education will

depend to a very large extent on the professional grounding teachers receive at the Colleges of Education. Since the underlying root of educational technology is the rigorous application of empirical inductive methodology, teacher-training based on such methods should supplement that based on the theoretic-deductive approach.

## CHAPTER IX

### AN EDUCATIONAL TECHNOLOGY CENTRE FOR MALTA

The implementation of an educational technology policy on the scale and scope that have been developed in the foregoing chapters will require more than the training of teachers in new pedagogies. Indeed such training without environmental support, in the form of new curricula and educational materials that make these pedagogies possible, will act as a disfunction to the whole educational system. Teachers who become favourable, knowledgeable in, and committed to the use of modern pedagogical methods will be greatly handicapped and disillusioned if they discover that the educational content and materials necessary to perform the required techniques, are lacking in Malta. Therefore, the realization of any educational technology policy cannot come about with half-hearted attempts like those which launched educational television in Malta without planning for the necessary personnel or facilities, and established an Audio-Visual Aids Centre without any funds or facilities being set aside for the purpose.

Similarly the objectives of the educational technology policy will not be achieved if the work involved is simply tagged on to that of overworked personnel who, already committed to equally deserving work, cannot devote the time and energy such a venture requires.

The advice of the authors of The New Media: Memo to Educational Planners (where they list the prerequisites for success in the use of

educational media) is appropriate here. They write:

The most important [prerequisite for success] is that everyone who will have an important role in the undertaking must be really serious about it. ... If the project is to be undertaken at all it should be viewed as a priority and not as a marginal activity (Schramm et al., 1967a, p. 161).

Haney et al. give similar advice when they point out that much of the effectiveness of educational technology depends on the capacity of the administrators of the educational system to create the kind of framework within which improved teaching and learning is possible (1968).

As a priority, it is proposed, that a body committed to the implementation of an educational technology policy be set up to create the framework within which such a policy can be carried out.<sup>1</sup>

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<sup>1</sup>To provide this kind of framework in Great Britain, the Brynmor-Jones (1965) report on Audio-Visual Aids in Education strongly recommended the establishment of "high activity centres" which would give special emphasis to the development of educational technology. The outcome of this recommendation was the establishment of the National Council for Educational Technology, which has become one of the leading bodies concerned with this aspect of educational development. The establishment of N.C.E.T. and its effectiveness on the general educational scene in Britain has created interest in other parts of the Commonwealth. The State of New South Wales in Australia, for example, has established the Centre for Advancement of Teaching (Meyer, 1967) whose objectives are very close to the N.C.E.T.'s. A recent report on the use of television and technology in universities in Ontario (Trotter, 1970) recommends the establishment of a Centre for Instructional Development in Higher Education, and here again the report's recommendations follow very closely the services being provided by the N.C.E.T. A further example in the Commonwealth comes from Ceylon, where plans for the revision and upgrading of the curricula included the establishment of the Ceylon Curriculum Centre, which in effect does not restrict itself to curriculum development, and is involved in the whole range of educational technology activities (cf. Hawson, 1970). The Quebec Ministry of Education provides a comprehensive educational technology service through its various divisions, primarily the Service des Moyens Techniques d'Enseignement. The activities of these active or proposed centres link together and improve on the work which has been going on in North American educational institutions where a variety of centres have been in existence for some time. The educational technology involvement of the last mentioned centres vary from those that act as storage and distribution centres for

Working in conjunction with, and under the overall direction of the Educational Planning Unit, this body --hereafter referred to as the Malta Educational Technology Centre (or the Centre)-- will be responsible for providing the strategy and co-ordination of all the educational technology resources in the educational system. The personnel and facilities of the Centre will provide counsel and logistical support to make possible the educational technology policy described in the foregoing chapters. At this point, it is important to stress the Educational Planning Unit's general direction since this Unit has the overall task of establishing the objectives of the educational system, co-ordinating the Department's resources and identifying for the Centre the areas it will need to concentrate on and develop.

As its title suggests the Malta Educational Technology Centre will be involved in curriculum development, production, evaluation and distribution of educational materials, and as a source of information on educational technology. Consequently its role should not be confused with that of Audio-Visual Aids Centres or Resource Centres as most of them function in North America and Western Europe; these are mainly concerned with the production, distribution, and use of educational materials. The work of the Centre will have a broader aspect than this and will concentrate on two general areas.<sup>2</sup> Firstly, it will seek

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audio-visual aids, to those engaged in pure educational research similar to the work carried out at the Ontario Institute for Studies in Education, and the Educational Development Center in Massachusetts, among others.

<sup>2</sup>The conclusions and recommendations contained in this chapter are based on information gathered through personal visits to educational institutions and readings as listed in Appendix III.

out educational problems that require investigation, (e.g. the relevance of content, educational materials and the instructional process in view of Malta's needs and circumstances). It will carry out research and development programmes in curricula and methodology; in conjunction with the appropriate bodies, it will make recommendations on the optimum way to reach them. Secondly, given objectives and procedures, the Centre will fulfill its responsibilities through activities in the following areas: (1) Research and Development, (2) Production and Distribution of Educational Materials, (3) Educational Communications, (4) Training, and (5) Information Services.

#### Research and Development

Malta's educational system, particularly at the primary and secondary level is greatly influenced by Britain's, to the extent that curricula are often imported with no adaptation to local needs. This difficulty is compounded by the small population of the Islands and limited finances which make it difficult to produce materials, including books, for a purely local market. The Department is aware of these difficulties and encourages teachers to develop and adapt curricula relevant to their pupils' needs. Whenever this happened, it is on a small scale. Most teachers do not have the expertise, facilities or time to carry out their own research in curricula; those who do, work in isolation and rarely in a systematic way. The same applies to teachers who experiment with new ways of teaching and learning and with the use of educational materials.

During visits to schools, the author often came across teachers involved in innovative activities which they carried out on their



initiative and at their own expense. Some were duplicating each other; in most instances their efforts would have been greatly improved with a measure of pedagogical or technical help, or access to a workshop. Invariably only their immediate colleagues were aware of their work, and only their immediate students could benefit from it. For example, there were teachers talented in the Maltese language who were involved in writing excellent supplementary reading material for their classes. However, due to lack of materials and the proper know-how, they were typing this material on regular paper and obtaining three or four extra carbon copies of each story. Most had to retype this material --admittedly with additions and improvements-- every other summer. Access to print reproduction methods would have provided not only their students but also many others, with good quality prints at much cheaper per capita costs. More significantly, it would require less valuable time which the teacher could spend more profitably than in copy-typing. Another example involved one particular teacher who produced a series of Ancient Maltese History charts (which the author discovered by chance), and which were adapted as teaching kits and distributed to all primary schools in Malta. Yet another example involved teachers who developed a series of slides of local flora, which on the one hand would have been greatly enhanced with the use of close-up lenses and, on the other, might have enjoyed wider dissemination. Several other cases could be cited.

Rather than discourage such individual efforts at research and development, the Centre will seek ways of encouraging and co-ordinating such activities by helping teachers interested in related areas to work together; and by offering both the services of its personnel and the use of its facilities. When useful, validated results are obtained, the

Centre will undertake to make them available to others. Furthermore, it will undertake systematic research and development programmes by drawing upon the services of experienced teachers, educational psychologists, teacher-educators, educational planners and communication experts to develop, carry out, evaluate and consolidate pilot schemes designed for Malta's particular needs. In developing such programmes, the Centre will attempt to benefit from work being carried out at the Royal University of Malta, and other educational institutions, as well as those in other countries on the assumption that it need not "rediscover the wheel". At the same time it will be cautious about haphazard untested adoptions; its approach will reflect on awareness of Beeby's warning that "A school system is closely related to the country it serves. Educational transplants are rejected as readily as human organs unless one studies the recipient as closely as the donor" (1970, p. 52).

In its research and development work the Centre will aim at bridging the gap between theoretical ideas and instructional practices, so that theoreticians and practitioners can develop mutual understanding and respect for one another (Becher, 1969; Saettler, 1969; Mitchell, 1971c).

#### Production and Distribution of Educational Materials

The production and distribution of educational materials will be closely integrated with the research and development commitments of the Centre. Indeed, the Centre's research programmes will include the development and evaluation of educational materials; it must resist the temptation to become merely the caretaker and distributor of audio-visual

aids.

In the production and distribution aspect of its work the Centre will carry out extensive survey projects to establish the quality and relevance of educational materials that are available in educational institutions (including idiosyncratic materials prepared by teachers), as well as to establish what other materials are required to make an educational technology feasible. A pilot inventory, started by the author, revealed a chronic shortage of materials, a situation which needs to be remedied without delay if any serious attempts at educational technology are to be contemplated. For example, in 1966 none of the primary schools had movie projectors, over twenty-five per cent lacked filmstrip projectors, and much of the software used was outdated and educationally useless. The survey revealed that some of the materials designed for other countries were quite irrelevant to local schools. At the same time the author became aware of a few schools which were building up resource centres with such educational materials as Cuisenaire rods, self-instructional programmes, and Nuffield Project Kits in language and science teaching. These schools expressed the need for continuous encouragement and support in the form of advice and help for facilitating the acquisition of educational materials.

Therefore, besides producing and distributing educational materials to reach specific local needs, the Centre will help local educational institutions select, evaluate and acquire educational materials of the highest quality, whether they are locally produced or imported. In this objective, it will help to eliminate what Lewis calls the "frustration caused by clerical and administrative staff

questioning the professional judgement of academic staff, or otherwise delaying purchase and supply" (1967, p. 9).

To encourage teachers and students in the production of their own educational materials, the Centre will help educational institutions at all levels set up basic production areas as a physical extension of their library and resources facilities. Initially these facilities will include equipment for the production of wall-charts, slides and filmstrips, graphics, three-dimensional polystyrene models, paper duplicating processes and tape-recording equipment. At a later stage 8 mm movie equipment, slides duplicating equipment, overhead-projector slides makers, and V.T.R. equipment might also become available if needed. At the same time, the Centre will have available on its premises, facilities for the production of educational materials which involve more expensive equipment and which the individual school would normally be unable to acquire. The facilities, which all educators would be able to utilize, would include equipment necessary for more intricate and complicated work such as mass duplicating of audio-visual production, synchronization of video and audio tracks, special effects in photography, as well as facilities to prepare materials for educational broadcasting and film production. It will also build up a bank of "software" resource materials (e.g. slides, overhead transparencies, films, video tapes, tape recordings) which educators could duplicate to construct instructional packages. The Centre will undertake to produce educational materials when special requests are made from schools or individual teachers. These, and its other productions, the Centre will adapt for general educational viewing and participation through the mass media.

The Centre will allocate equipment and educational materials and will look for the best procedures of making them available to the various educational institutions. It will undertake, for example, a cost-benefit analysis to establish whether major items of equipment such as tape-recorders, projectors etc., should be purchased by the Centre and supplied to institutions "on permanent loan", or whether they should have the complete freedom to acquire whatever type or brand of equipment they desire. A cursory analysis suggests that the first scheme would be of greater benefit to the schools on several counts. Firstly, the Centre will be able to purchase equipment in bulk at considerable savings over individual institutions acting on their own. Secondly, standardized equipment will save considerable amounts of funds by eliminating the need to stock a variety of incompatible spare parts. In fact defective units could be stripped for spare parts. Thirdly, the institutions will not have to wait long for repairs, since the Centre will replace defective equipment from its stocks. Such an arrangement which will not be possible if the equipment was incompatible or purchased by the institutions. Furthermore, standardized equipment will both facilitate operational training programmes and lead to more efficient handling of the equipment since teachers will use the type of machines they had been trained to operate. Standardization of equipment would become a favourable factor should self-instructional programmes in the operation of equipment be devised (Farrugia, 1971). At the same time, however, various educational institutions must be free to purchase --perhaps through the Centre-- content (or software) materials and non-standard equipment according to their needs and preferences.

In its attempt to produce and distribute the highest quality educational materials to educators, the Centre will not restrict itself to materials that satisfy only traditional methods of teaching and learning. It will actively support the production of new materials, and promote and facilitate new approaches to instruction.

### Educational Communications

The Centre will investigate extensively the effectiveness of the present approach to radio and television broadcasting. There is no doubt that with the limited facilities, personnel and finances available, the School Broadcasting Unit is providing a valuable service (cf. Malta Broadcasting Authority, 1970, pp. 55-62). However, it will be the Centre's responsibility to work with the School Broadcasting Unit to establish on the one hand whether improvements are possible in classroom-related activities and, on the other, whether the present service is the best the Unit can provide. For instance, it is important to ascertain if educational broadcasting in Malta is like most countries where

... the educational authorities, and broadcasting organizations also, are strongly hesitant when it comes to technological developments. ... there is no ignoring the apparent readiness to stay in the first generation of radio and television (Council for Cultural Co-operation, 1969, p. 5).

The Centre and the School Broadcasting Unit will set up joint research programmes and pilot schemes to determine how the special attributes of radio and television can be utilized to serve best the needs of Maltese learners in intra-mural and extra-mural education. They will pay particular attention to develop ways in which educational broadcasting

could be used in the adult, vocational and enrichment educational projects of the community: areas which so far have remained largely neglected.

Another related area for exploration will be to determine more precisely the Department's commitment in Educational Broadcasting. As explained earlier, the Department's present role is minimal. Subjects, content, script-writing and production are the total responsibility of the School Broadcasting Unit, which is a branch of the Malta Broadcasting Authority. The Department of Education's role is limited to an advisory capacity through the School Broadcasting Advisory Committee, a situation that arises from the Broadcasting Ordinance which stipulates that all broadcasting responsibilities in Malta should rest with the Authority. The relationship between the two bodies is most cordial and co-operative; however the fact remains that the Department's role in Educational Broadcasting is insignificant despite the fact that it is the major user (until 1970, the only user) of school broadcasts. This role could be increased considerably through co-operation between the Malta Educational Technology Centre and the School Broadcasting Unit.

As stressed earlier, the fact that Malta does not as yet have vast finances committed to the provision of one particular type of educational materials, gives the local educational authorities an opportunity to evaluate the attributes of the "traditional" communications media with recent developments in video and audio tape, and instant retrieval systems. These, due to Malta's size and relatively small number of educational institutions, might prove more efficient and conducive to Malta's specific needs. Anthropologist Hall has described how in many parts of Latin America, people have by-passed the automobile and the need to build expensive road-networks by adapting themselves to

air travel (1959, p. 83). The Maltese educational system might be able to do the same in educational communications by utilizing newly developed materials and techniques. Thus it might consider the adoption of portable video recording equipment, cassette sound recording systems which incorporate the use of slides or filmstrips, or the combination of several materials in self-instructional packages. It might investigate the wisdom of expanding its open-circuit broadcasting (which provides needless immediacy without opportunities for teachers or students to control the schedule, or pace of, much less to review, the presentation) or of investing in 16 mm projectors and film libraries which might prove less versatile, more complex, and ultimately more expensive to operate and maintain than techniques and materials mentioned above.

The Centre will avoid over-stressing the use of apparatus (or hardware) over what will be its primary function, namely the introduction of innovative and efficient instructional methods and systems to improve the learning process. The unqualified and aimless use of educational materials would not only distract from the real work of the Centre but would also alienate those educators, who, already suspicious of mechanical and technical devices, might withhold or withdraw their potentially valuable contributions. One should note, for instance, that the whole Telekolleg programmes in Germany was in jeopardy when, due to lack of planning and time to orientate participating teachers, those who conducted the "in class" sessions did not fully understand the scope of the programme and their role in it. Furthermore, due to lack of preparation and liaison, they disapproved of (since they could not understand) the radical methods adopted by the "television teachers", and therefore tried to counteract them by repeating the lesson content in



traditional forms during the classroom sessions. Thus the scope of the classroom sessions, which were devised as consultation periods, was lost and the students were confused. The problem was solved by getting the classroom teachers to take a more active role in the planning stages of the programmes (Schardts et al., 1970, pp. 36-37).

### Training

The type of training provided by the Centre will be quite different from conventional teacher training, and will not attempt to duplicate that of the Colleges of Education (see Chapter VIII). This does not mean that the Centre will not assist the Colleges of Education in their regular training and in-service courses. On the contrary, the Centre and the Colleges should develop close links and draw upon each other's personnel, experiences and facilities.

### Research Oriented Training

One type of educational technology training provided by the Centre will be research oriented. The participants will be experienced educators, subject matter specialists working at all levels of education, teacher-educators, and school administrators, who will be released from their regular duties for a specific period<sup>3</sup> to undertake research, development and dissemination studies in the various aspects of educational technology. Some would work at the Centre, some in experimental classrooms at various levels of education, and others will become involved in educational communication research, while others

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<sup>3</sup>The fact that Malta has an overabundance of redundant teachers makes this proposition quite feasible.

will be encouraged to carry out experimental work in industrial training centres, or adult and further educational projects. Their work will depend on rigorous observation and testing procedures aimed at confirming or rejecting pre-determined or explanatory hypotheses, as well as the empirical development of educational materials. At the end of their term at the Centre, they will return to their original occupation<sup>4</sup> to put into practice, and spread among their colleagues, the findings of research at the Centre. Such procedures will encourage both the adoption of terminal (i.e. applied Research & Development projects) and the revaluation of objectives and function of the Centre's personnel. It will prevent the Centre from perpetuating its existence through never ending projects.

#### In-Service Training in the Schools

An important function of the Centre will be to introduce innovative instructional ideas through activities outside its premises. This work will be carried out through the full-time service of Educational Technology Specialists<sup>5</sup>, who would extend the Centre's activities directly into the various institutions through regularly scheduled visits. Besides being engaged in Research and Development work at the Centre, the Educational Technologists' work will be to spread innovative ideas in instructional methods, advise schools on the acquisition and use of educational materials and equipment, and assist teachers and students in their productions. They will conduct lessons which illustrate the

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<sup>4</sup>Some might begin a new career (e.g. in Further Education, Industrial Training).

<sup>5</sup>These would be graduates of the Educational Technology Specialist Course, as described in Chapter VII with at least two years of teaching experience.

practical and effective use of educational technology. They will help Headteachers, and those teachers in charge of library and resource centres who are not Educational Technology Specialists, to select appropriate educational materials and equipment. They will conduct in-school seminars and workshops for educators in the production and utilization of educational materials. Thus, through their activities at the Centre and at educational institutions, Educational Technology Specialists will act as a continuous liaison between these bodies.

### Training at the Centre

The Centre will organize conferences, seminars, meetings and workshop-sessions on its premises and elsewhere (e.g. in regional schools) to widen and reinforce the work carried out by the Educational Technology Specialists.

The purpose of these activities at the Centre will be three-fold. Firstly, the Centre will organize courses and seminars on basic or core issues such as the rationale of educational technology, instructional design, testing procedures, graphics, new developments, etc. The purpose of these seminars and core courses will be to avoid unnecessary repetition in individual schools, thus freeing the Educational Technology Specialists for individual attention to particular problems encountered by schools. Secondly, seminars will allow teachers of similar interests to discuss, exchange experiences, recognize mutual problems, and engage in co-operative activities towards solutions which a single teacher on his own might fail to reach. Thirdly, meetings at the Centre will provide visitors with opportunities for personal contacts with the Centre's personnel, as well as provide

them with first hand experiences in using the facilities available there. Such meetings will also create opportunities for educators and educational technology policy administrators to become better acquainted with each other's objectives, constraints and approaches to educational technology issues.

As an extension to its training programmes, the Centre will make its resources and workshops available to teachers and students who wish to produce their own educational materials but lack facilities in their schools. Such arrangements should encourage teachers to keep in touch with the Centre, as well as provide them with tangible proofs that the Centre's purpose is to be of service to the educational system.

#### Dissemination of Information

The fifth function of the Centre will be to collect and disseminate information pertinent to educational technology.

Through its contact with the schools, colleges of education, the University, and other local educational bodies, the Centre will aim at having the broadest and most accurate information on what is taking place on the local educational scene. The Centre will keep in touch with those teachers or researchers who are engaged in educational innovations. It will keep track of the effects of past experiments in educational innovations and evaluate their long-range results.

Through its overseas contacts (especially with such bodies as the British National Council for Educational Technology, Centre for Educational Development Overseas, University Departments of Education involved in educational technology, as well as commercial concerns

involved in educational materials production and development), the Centre keep abreast with current developments in educational theories, practices, and materials. Its staff will evaluate and ascertain the relevance of major overseas research in educational technology to Malta's needs.

In close co-operation with the Educational Planning Unit, the Centre will attempt to predict (and where necessary initiate) educational trends and create an environment in which innovations will have the most beneficial impact. The Centre will evaluate this information, and pass it on to the widest possible circulation through news-letters, special-topic pamphlets, research reports and, when appropriate, through the mass media. Furthermore, copies of published or acquired materials will be available for visitors to the Centre's resource area, which will also include facilities for the inspection and evaluation of educational materials and equipment.

While making use of all its facilities to collect and disseminate information, the Centre will concentrate most in fulfilling this function through personnel contacts and rapport between its personnel and those it would be meant to serve, namely the teachers and students of the educational system.

The foregoing recommendations may appear too ambitious a scheme for a Centre that is not yet in existence. However, it should be pointed out that the Ministry already carried out some of the above mentioned services. For example, there are committees advising on School Building and Equipment, Text Books Selection, and School Broadcasting. Many school Inspectors are at one time or another involved in innovations in their particular area of interest. The Stores Office of the Department handles the ordering and requisition of educational materials. The Department has a Visual-Aids Office (separate from the Audio-Visual Aids Centre)

which distributes ready made films and filmstrips to the schools. It has an Audio-Visual Aids Centre<sup>6</sup> which was building up an educational resource centre and was involved in collecting and disseminating information relevant to educational materials. This centre was also carrying out pilot research and inventory programmes, as well as producing visual materials specially designed for local use. In close co-operation with Colleges of Education and the School Broadcasting Unit it ran seminars and conferences on the utilization of educational broadcasting.

However, the above activities by the various committees, groups and individuals are rarely co-ordinated in a well planned, systematic programme, to the extent that, as Cameron points out there are "too many 'ad hoc' decisions which ignore their later implications and indeed occasionally modify almost to the point of reversal carefully thought out and fully approved administrative measures" (1970, p. 22). Through empirical research and systematic programming inherent in the educational technology policy, the Centre will assist the Educational Planning Unit in providing the required co-ordination and implementation.

#### The Administrative and Operative Set-Up of the Educational Technology Centre

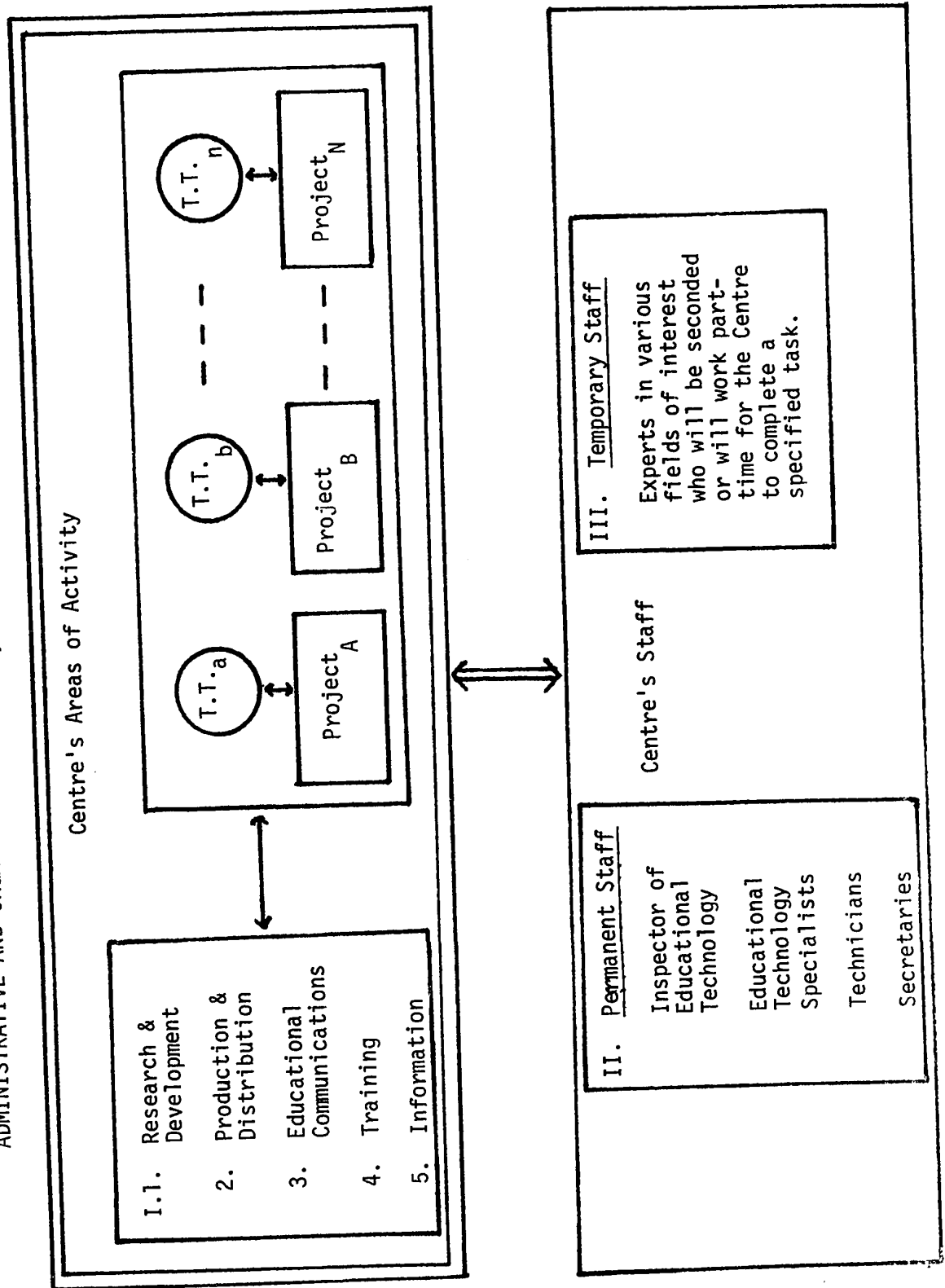
The administrative, organizational and operational structure of the proposed Educational Technology Centre is schematized in Figure 7.

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<sup>6</sup>The title Center here is a misnomer. The Audio-Visual Aids Centre consisted of one big room, an office and a small storeroom, run by the author with the valuable assistance of student teachers of the college where it is located.

FIGURE 7

## ADMINISTRATIVE AND ORGANIZATIONAL SET-UP, MALTA EDUCATIONAL TECHNOLOGY CENTRE



Thus, the Centre's activities will be concerned with the five general areas as described earlier, and identified in module I by the numerals 1 to 5. Once educational objectives are established, the general activities will be reformulated in tasks or projects, aimed at solving a specific problem (Project<sub>A</sub> to Project<sub>N</sub>) which may include one or several of the general activities. The Centre's projects will be carried out by a small permanent staff (Module II) assisted by temporary staff (Module III), with both categories working in temporary teams (T.T.a to T.T.n).

#### Permanent Staff

The permanent staff will be mainly concerned with the executive, administrative, and everyday functions of the Centre. The permanent staff need not be large<sup>7</sup> since its primary function would be to co-ordinate, and provide continuity to, the Centre's activities. The administrative and executive head of the Centre will be responsible for initiating educational technology activities for the educational system, and co-ordinating the Centre's five areas of activity. He will direct feasibility and analysis programmes in the use of educational technology, advise Educational Planners on the role of educational technology in national educational projects, plan and manage the utilization of educational technology programmes for educational institutions, and establish and maintain overseas contacts.

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<sup>7</sup>Exact numbers can be suggested only once specific areas of concentration and functions are identified (See Chapter X). A cursory analysis suggests that a director, four educational technology specialists supported by two technicians and two to four secretaries should be an adequate staff to fulfill the responsibilities of establishing the Centre as described in the following chapter.



Since his responsibilities involves the efficient functioning of several areas of the Department of Education, and since his decisions are likely to have far-reaching effects on various sectors of the educational system, the director's post should be one of high status and remuneration. Since he will be operating at a level comparable to (and possibly higher than) that of Subject Inspector, his position in the Department should be in the same category as that of an Inspector. Hence the director of the Malta Educational Technology Centre is referred to in Figure 7 as Inspector of Educational Technology.

The functions of the permanent Educational Technology Specialists have been described in detail in earlier sections of this chapter (see also Chapter VIII). Briefly, they will be mainly concerned with organizing and spreading the Centre's activities to the Islands' educational institutions, and participating in the Centre's terminal projects, as members of the operational temporary teams. The technical, secretarial and janitorial personnel will provide support services in the relevant areas required at the Centre.

#### Temporary Staff

Rather than employ on a permanent basis a number of persons with several areas of expertise who will be expected to carry out duties in its varied activities (including those for which they might not be eminently qualified), the Centre will rely on the temporary services of acknowledged experts in any required area. These persons will be seconded in full-time or part-time employment from the Department of Education or other sectors of government service, or hired from private sectors, to team up with other experts and the Centre's own staff to

serve for a period of time on a particular task or project.

Such an operational set-up offers several advantages. Firstly, the Centre's scope and activities will not be restricted by the limited area of expertise and capabilities of its staff, since it will be able to draw upon the intellectual and technical expertise and capabilities of the community at large. Thus one can envisage experienced teachers teaming up with an educational psychologist, a communications expert, an electronic engineer, and an apparatus designer working together to devise a self-instructional system. Similarly, one can visualize a subject matter specialist with no teaching experience, working with a seasoned teacher, a communication expert, a broadcaster, and a graphic artist to produce a series of educational television programmes. The possible combinations are limitless.

A second advantage closely related to the first, derives from the likelihood that the Centre's activities will be revitalized through the active participation of transitional personnel who will induce ideas and interests in greater numbers than a small static number of persons can normally master. Thus while the Centre will provide the consistency of purpose and continuity through its permanent staff, at the same time it will benefit from the different outlooks and interests of its temporary staff.

The establishment of a system designed to execute specific and terminal projects will also help the Centre evaluate and review its objectives at the end of a particular project, so that it will less likely be engulfed in routine activities. Furthermore, the continuous evolution which should result from the changing pattern of

temporary personnel will tend to restrain the Centre from becoming a sedimentary organization pre-occupied with perpetuating itself or its structures by retaining concepts and performing tasks which, initially worthwhile and necessary, may eventually become superfluous. Thus, the Centre will ensure that it will not become a bureaucratic body draining public funds to sustain itself; instead, it will become a focal point for many educational projects to bring about the realization of the proposed educational technology policy for Malta.

## CHAPTER X

### ESTABLISHING THE FOUNDATION OF THE EDUCATIONAL TECHNOLOGY POLICY

#### A Four Stage Programme

The realization of the foundation of the educational technology policy can be achieved in four, one-year stages of development, as summarized in Appendix IV. The author uses foundation in full awareness of its limited connotations especially as he considers the scope of an educational technology policy as one that should encompass far more than four years of an educational system's existence. In fact, an educational technology policy, as developed in this work, should become an integral part of the educational system's growth. However, throughout this work the author has been aware that the principle of empirical analysis and diagnosis of the stated problem is inherent in Educational Technology; therefore he cannot prescribe solutions to unidentified problems. And the problems faced by the educational system after four years of the educational technology policy's realization will be quite different from the prevalent ones.

#### 1. Preparatory stage

The first stage of development will be devoted primarily to research studies, orientation programmes and projects aimed at remedying the most serious shortcomings that may prevent further

realization of the educational technology policy (see Appendix IV).

The first step in establishing the base for an educational technology policy will be the formation of a three-man Preparatory Team whose collective expertise will cover the three fundamental aspects of Educational Technology; namely educational planning, curriculum and methodology development, and the application of educational materials. Through empirical research this team will establish an order of priorities and plan for the other stages of development.<sup>1</sup>

Through personal contacts with the Islands' educational institutions, and through the information media, the team will undertake to orientate educators to the scope and function of the educational technology policy. They will establish and evaluate the institutions' needs and expectations of the policy, and will delineate the proposed Centre's course of action accordingly.

The preparatory team will conduct surveys of the educational resources and materials in order to establish their nature, quality and quantity. Where necessary, it will recommend the repair, replacement or acquisition of educational materials that are essential for the operation of effective instructional processes.

At this stage of development, the team will initiate contacts with local and overseas institutions involved in Educational Technology work. Setting the trend for future activities, it will commission parts

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<sup>1</sup>For reasons that will be elucidated later, the members of this team need not work on this project on a full-time basis, although one of the three, who will act as the co-ordinator of the project, will be required to devote the greater part of his duties to it.

of its responsibilities to "Temporary Teams" (see Chapter IX) so that, for example, the information dissemination task will be carried out by "Temporary Team 'a'", the detailed processing of the educational materials survey will be performed by "Temporary Team 'b'", while the recommendations on repair and replacement of equipment will be provided by "Temporary Team 'c'".

In readiness for the second stage of development the team will set plans for the formal establishment of the Malta Educational Technology Centre by selecting a permanent location, one that allows for future expansion. It will also initiate the recruitment of the Centre's first group of personnel, --namely its director (and future Educational Technology Inspector), two educational technologists and a technician-- and set the criteria for their selection, depending on the findings of its research projects. Once the Centre is established the services of the existing Audio-Visual Aid Centre and the Visual Aids Office will be incorporated into the new structure.

Concurrently with the above developments, the present two Audio-Visual Media General Specialists courses at the Colleges of Education will be revised and re-organized (see Chapter VIII) by the lecturer responsible for them to meet the requirements of the Educational Technology Policy.

## II. Establishment stage

The work initiated during the first year will be expanded (see Appendix IV). The Centre and its initial staff will be formally established and, with the assistance of the preparatory team will

devise, initiate, execute and evaluate projects in those areas of high priority established by the preparatory team. Temporary Teams will be organized to research, make recommendations, and carry out projects in the five main areas of the Centre's activities.

Thus, research and development programmes will be undertaken (i.e. in methodology, curricula, development of educational materials and allocation of resources). Contacts and visits to educational institutions to help them solve specific problems will be established on a regular basis, and the production and distribution of educational materials will be organized in a systematic manner. In conjunction with the Colleges of Education, the Centre will undertake in-service training at the Colleges of Education and regional schools in educational technology related areas which the research programmes will have established as crucial for further development. The Centre will start building its educational resources and production facilities and will help schools, through advice and the acquisition of materials, to build their own.

During this stage of development, the Centre will continue its efforts to establish contacts with local and foreign institutions whose activities are related to its own. It will expand its information service to provide information sheets on educational technology topics for local educators, publish special-subject pamphlets, and provide an on-demand enquiry service.

### III. Expansion stage

This stage will concentrate primarily on the research and development projects since further expansion of the Centre's activities,

and further developments or revisions of the educational technology policy's objectives, will have to be determined by the outcome of these projects (see Appendix IV).

With the co-operation of the Islands' other educational institutions, some of whose members will be working on the Centre's Temporary Teams, experimental classes at the different strata of the educational system will be set up to develop. This will permit the Centre to validate educational content, processes and materials that are conducive to local conditions and fulfill specific, local needs.

During this stage, the Centre will also concentrate on the dissemination of information by publicizing its aims, functions and findings. With the co-operation of the government information agency, teachers' organizations and parent-teacher associations, it will hold meetings, run seminars and utilize the mass media to make known the scope of the Department's educational technology policy, publicise the Centre's activities, and, if necessary, draw upon the community's goodwill and assistance to reach its goals.

Such public-relations work will be done through several sources ranging, for example, from P.T.A. meetings, to having Educational Technology at the theme for the Malta Union of Teachers annual National Conference. Another method would be for the Centre, with the co-operation of the Malta Union of Teachers and P.T.A.s to organize regular magazine type television



programmes dealing with instructional innovations.<sup>2</sup> Such a programme could become the major information dissemination source, and at the same time serve as one mode of "teacher training" for teachers and parents alike.

A primary activity during this stage will be the expansion of resource and production facilities at the Centre, so that these will contain those materials that the research projects will have established as essential for the development of efficient instructional practices. In co-operation with the School Broadcasting Unit, it will undertake the production of multi-media packages for educational institutions and self-instructional packages for the community at large. The resource and production facilities at the Centre will be made available to teachers, especially those who lack facilities in their institutions.

The in-service training in educational technology will be extended to include those that range, for example, from a major course in "Aspects of Educational Technology" administered on a national basis, to small production courses held on school premises. Since the regular activities of the Centre (apart from those projects undertaken by the Temporary Teams) will have increased considerably in all five areas of interest and since they will increase further throughout the fourth stage, the permanent staff will be reinforced by two more educational technologists and another technician.

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<sup>2</sup>The local television station, as well as the Malta Broadcasting Authority produce and air programmes with restricted appeal (i.e. gardening, photography, sewing, farming, carpentry); most likely they will be receptive to suggestions of airing a programme that should appeal to the majority of viewers.

#### IV. Consolidation and validation stage

During this period, the Centre will consolidate and validate its work in establishing the educational technology policy in order to lay foundations for the policy's next stage of implementation (see Appendix IV). Thus, this period will be devoted to the completion of its research and development projects (unless these have been established on a long term basis).

During the fourth year of development, the Centre will concentrate on assisting educational institutions to extend their resource and production facilities beyond basic requirements and assist teachers, through training-programmes, to make use of them. Several factors will be conducive to make this possible. By this time, the Centre's personnel will have built firm contacts with the Islands' educational institutions, and, reinforced by findings of research programmes carried out during earlier stages, will be able to establish a clear pattern of these institutions' needs, and develop ways of meeting them. Further, the provision or repair of basic educational materials and apparatus, initiated during the second year will be completed, so that further expansion in this area becomes possible. At the same time, enough graduates of the Educational Technology Specialist courses will become available to take charge of and develop the extended resource and production facilities of educational institutions.

While these facilities will provide educational materials and equipment normally required by the various institutions, the Centre will provide resources and production facilities which are not in great demand in individual institutions or which are too costly for

them to acquire.

Throughout all four stages of development, the Educational Technology Inspector, as the head of the Centre will conduct studies with members of the Educational Planning Unit and other Units to establish further roles for the Centre in the educational system, with particular reference to (a) Educational Broadcasting, (b) Vocational Training and Education Permanente projects, and (c) Community Development and Cultural Enrichment programmes.

One area of investigation, for example, could be the development of present library facilities into "community multi-media resource centres" which will become available to people for their self-instructional or cultural enrichment aspirations. Another area in the Further Education field which the Centre could pursue, is production of multi-media presentations on a given theme, (for example, Technology in Agriculture, Fish Farming, New Ideas and Techniques in Education, Community Projects, etc.), and build this theme into a major exhibition. After a suitable time in Valletta (the capital), the exhibition can tour towns and villages to have the widest possible exposure. Naturally the research and work spent on the exhibition can be utilized further in developing instructional packages comprising replicas of the materials used in the major exhibition. Such enterprises would bring the Centre's work directly to the community at large, in a dual role of educator and promoter of its work.

Finance

The question of finance cannot be ignored although at this early stage it is difficult to assess accurately. However, it is possible to predict that because of Malta's special circumstances, particularly the existence of redundant teachers which the government is committed to employ and the availability of underutilized school space, the cost of establishing and administering the educational technology policy will not be as high or prohibitive as it might seem at first. Indeed, the educational benefits should far outweigh any additional cost of setting up and administering such a policy since it should lead ultimately to better utilization, and therefore, lower "per capita" costs, of educational resources which presently are under- or mis-used.

Capital costs

The cost of establishing and administering the proposed educational technology policy through the Malta Educational Technology Centre can be divided into two major areas. The first is the capital cost of constructing or converting a building into the requirements of a Centre, and equipping the Centre and educational institutions with educational materials required to implement the educational technology policy. The second area comprises the operating costs of salaries and maintenance of the Centre.

Several factors act as favourable agents to render the whole policy far less costly than it might appear. First, the Centre can be located in school space which presently is under-utilized. If such space might prove unsuitable, the Government can allocate unused

premises which have been vacated --prior to the recent dispute with N.A.T.O.-- by the British forces. Thus, a considerable sum would be saved since neither land purchase nor major construction costs would be required.

A second favourable factor concerns the purchase of equipment. If the Department accepts the Lewis (1967, pp. 24-25) and Cameron (1970, Appendix IX) recommendations, and decides to equip schools with the educational materials required to make possible instruction practices compatible with the educational system's needs, considerable sums would have to be spent on educational equipment whether or not the proposed educational technology policy is accepted. As explained earlier, the benefits which would accrue from the Centre's administration and direction in such matters as compatibility of equipment, training for efficient usage, expert buying and maintenance, and particularly, effective pedagogy in the classroom have to be set against any extra costs involved in establishing such a Centre.

Foreign aid could also be considered as a favourable factor in reducing capital costs for the establishment of the Educational Technology Centre. Should the Maltese Government accept such a proposal, it might find that international and external aid agencies will be willing to underwrite such a project for Malta, as they have done for many other countries (cf. Schramm et al. 1967a).

#### Operating costs

The operating cost of the educational technology policy, the maintenance of the Centre and the salaries of its staff would be the responsibility of the Department. However, it is suggested that these

costs need not be high; indeed with proper utilization of resources, the administration and maintenance of the Centre can be rendered virtually a "no cost" proposal. The following reasons are offered.

Since the Department has a number of redundant teachers, all the personnel of the Centre --except for the technical and secretarial help-- would be drawn from already employed teachers. The salary structure would follow that of comparable posts in the Department, so that the salary of the Educational Technology Inspector would correspond to that of other Inspectors, and that of the Educational Technology Specialist would correspond to that established for Specialist Teachers of art, music and physical education. Since the basic salaries for the proposed staff are already being paid, any increase would not be extensive. Furthermore, the Department could provide the services and facilities of the Centre on a cost recovery (or profit making) basis to other educational institutions such as the University, the Malta Colleges of Arts, Science and Technology or other Government Departments. The Centre could also make its productions available to the mass media, and its educational services to industry in the form of training programmes and instructional packages. Such services would not only benefit educational and retraining efforts of the educational system, but would also provide funds to cover the extra costs in salaries and maintenance incurred by the Department to administer the policy and the Centre.

The foregoing section is not meant to minimize or gloss over the important factor of finance, since the author considers it as a crucial one on which all other considerations depend. He realizes

that the above comments and suggestions are general and that a deeper study of the financial implications must be undertaken. At this stage, such a study is not feasible since it is impossible for him to acquire the required data. This section is meant to illustrate that the financial factor need not be an impediment to a successful educational technology policy and the establishment and efficient functioning of an Educational Technology Centre.

### Acceptance and Support

In the author's view, a far more important element than funds, in effecting the success or failure of the educational technology policy, will be the degree of acceptance and support it receives from its beneficiaries: students parents and teachers on one hand, and the administration on the other. In Meierhenry's words:

The acceptance of a novel idea is more rapid if the new idea is consistent with the values of those with recognized vested interests; the higher the prestige level of those promoting change, the more rapid is the rate of acceptance likely to be (1966, p. 460).

### A service to the educational system

A plan to promote educational technology in Malta should be clearly identified as a support service for people in the educational system, not just another administrative device to control activities in the schools. The Educational Technology Centre will have to present --and prove-- itself as an agent that functions to help them reach their objectives in a more efficient manner. The more the Centre and its projects are identified with the schools and needs of staff and students alike, and the more it consults with and seeks information

from experienced educators, the greater will be the likelihood of its success. As Schramm et al. conclude from the numerous studies gathered for their report The New Media: Memo to Educational Planners: "The more the new media are perceived within a system as our teaching, meeting our needs, the more likely they are to operate smoothly and efficiently" (1967, p. 95). A programme to develop educational technology in Malta, should follow Miles' advice in Innovation in Education, i.e. to seek the co-operation of high status members from the target audience since it is more likely to have its recommendations accepted particularly if the group is strongly legitimized by the system and maintains clear, open communications with it (1964, pp. 639-643).

#### Administrative support

All the foregoing, including the setting up of objectives for an educational technology programme as well as the means and methods of carrying it out, depend on the measure of administrative support received from the Department. Coles states that from his experience in introducing new schemes in educational systems in developing countries, government support is of crucial importance. He writes:

With the goodwill of government, much can be achieved, without it the efforts of those committed to educational innovation will be short lived if not prohibited altogether. A decisive factor, therefore, in the success of any scheme of education is the whole-hearted support of the statutory powers. If it is accorded a low priority by them, it will lose prestige generally in the country; where governments give moral and material support, they will find themselves aided by many allies, who through voluntary effort, will contribute in time and skill and enable the funds to spread much further than might otherwise be possible (1969, p. 65).



Evaluation of the introduction of educational media in several countries reported by Schramm et al. (1967a) concur with the above statement. The determination of the Governor of Samoa to bring change in the educational system through radical means, the strong support of the Minister of Education in Thailand for the expansion and a more prominent role of educational radio in the school system, and the firm backing of the school board to the pioneer Hagerstown experiment in close-circuit television, are well documented examples of strong government support leading to beneficial educational results. Conversely, the failure of the first attempt to develop school television in Columbia resulted from a change in government and the withdrawal of the new administration's support (Schramm et al. 1967, p. 102).

Parallel experiences can be cited in Malta. When the use of audio-visual materials, particularly the use of educational films, was given high priority in the 1950's, their acceptance and use were high (see Figure 3); when official support gradually dropped, the use of such educational materials dwindled and the Audio-Visual Aids Centre almost passed into oblivion. Although the Educational Technology Policy will have greater impact than an Audio-Visual Aids Centre, without the whole-hearted support of the Department, the proposed educational technology policy for Malta would never reach its objectives.

### Conclusion

This dissertation has attempted to set forth the rationale for an educational technology policy for Malta by pointing out that past restrictions to educational development can be overcome by better utilization of the Islands' human and material resources. It has

developed the structure and content of such a policy, and outlined the concepts and fundamental principles that should underline this policy in such areas as curriculum and methodology reform, educational materials development, resources utilization, teacher training and the role of an educational technology centre for Malta. Finally it has put forward suggestions how such a policy can be carried out with maximum benefit at minimum costs to the Department of Education.

In conclusion, the following statement by Ofiesh summarises well the rationale and conceptions underlying this work. He writes:

To meet the educational needs of a society caught up in dynamic and overwhelming change, we must constantly build into our educational system whatever efforts in research and developments are necessary for an effective technology of instruction. To extend the influence of able teachers and to develop more effective materials for instruction, we must concentrate on rigorous and extensive experimentation in areas critical to relevant education.

An educational engineering effort of this scope will require a national commitment from educators as well as those who provide the financial and physical resources of our schools (1970, p. 14).

The Maltese Educational System is continuously endeavouring to meet the increasing educational needs of a society caught up in dynamic and overwhelming change. The educational technology policy developed in these pages illustrated how the efforts of the Maltese Educational System can be strengthened and rendered more efficient through the utilization of intellectual and mechanical techniques applied within a developing technology of education.

## APPENDIXES

## APPENDIX I

### PROMINENT DATES IN EDUCATIONAL DEVELOPMENT IN MALTA

- 1561: The Knights of the Order of St. John, then rulers of Malta, opened a Secondary College (Lyceum) and a University chartered by Pope Pius IV. Both were administered by the Jesuits.
- 1768: The University was re-organized into a New Public University after its administration was taken over by the State.
- 1798: The French invaded Malta, and the Knights were expelled. Napoleon closed the Lyceum and the University; instead he established a Technical College and fifteen Elementary State-run schools. Until then, "elementary education" was provided quite extensively by religious orders through Sunday-school type instruction.
- 1800: The Maltese revolted against the French and with the help of Britain expelled them. The Lyceum and the University were reinstated, while Technical and Elementary Education were neglected.
- 1819: The Normal School Society's (Primary) schools were opened in the larger towns. These schools were partly subsidized by the Government.
- 1836: The Royal Commission on Education criticized the Government for the lack of education for the masses. Following the Commission's recommendations the Government undertook formal Primary Education and by the end of the century every town and village in the Islands had its own Primary School.
- 1842: The elementary school system, until then administered by the University, became completely State-run.
- 1880: The so-called Language Question Controversy followed the Keenan Report on Education which recommended that English and not Italian should be the official language. (It is interesting to note that the first organized political parties were formed on the Language issue. The Conservatives favoured the introduction of Maltese followed by English as

the two official languages, while the Nationalists favoured the continuance of Italian as the official language.)

- 1924: Semi-Compulsory education was introduced. The legislation stipulated that once a parent decided to enrol a child in school, the child could not be withdrawn before the age of fourteen.
- 1946: Compulsory Education till the age of fourteen years enforced. Although the Compulsory Education Act was passed in 1938, it was difficult to enforce it during the War.
- 1946: Full-time teacher training established.
- 1956: Considerable expansion was undertaken in Secondary Education, particularly in the Technical area. State-provided secondary schooling became tuition free, previously students paid according to a means test.
- 1957: Full-time primary schooling became available in all areas; previously many pupils attended school on a half-day basis, some attending in the morning, others in the afternoon.
- 1961: The Government expanded Secondary Education by subsidizing scholarships to private schools.
- 1970: "Secondary Education for All" came into effect. Following the fourth class of Primary School (6th Grade) pupils could go to either Grammar, Technical or the 'New' Secondary Schools depending on their success in the Secondary Schools Entrance Examinations.
- 1971: The Secondary Schools Entrance Examination was abolished when Grammar, Secondary Technical and New Secondary Schools were replaced by Comprehensive Schools.
- 1972: Free-tuition University education was introduced.

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### RESEARCH STUDIES IN AUDIO-VISUAL INSTRUCTION AS THE BASIS FOR SOME OF THE CONCLUSIONS REACHED IN CHAPTER IV SECTION TITLED "THE APPLICATION OF TECHNOLOGY TO EDUCATION"

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- Audio-Visual Aids Centre, Protestant School Board of Greater Montreal, Quebec, Spring 1971.
- Centre for Instructional Technology, Sir George Williams University, Montreal, Quebec, 1970-72.
- Department of Communication Arts, Loyola College, Montreal, Quebec, 1969-71.
- Education Media Centre, McGill University, Faculty of Education, Summer-Autumn 1971.

Service des Moyens Techniques d'Enseignement,  
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Ontario, Summer 1971.

Teaching Aids Centre, Toronto (City) Board of Education,  
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Audio-Visual Aids Centre, Surrey County Council, 1966

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National Committee for Audio-Visual Aids in Education,  
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Authority, London, 1966.

School Service Centre, Commonwealth Institute,  
London, 1967.

Teaching Aids Centre, All Saints College of Education,  
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Teaching Aids Centre, Brentwood College of Education,  
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Teaching Aids Centre, Shoreditch College of Education,  
Surrey, 1966.

Teaching Aids Centre, Whiteland College of Education,  
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Teaching Aids Centre, Bank Street College of Education,  
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## APPENDIX IV

### SUMMARY OF RECOMMENDATIONS FOR THE FOUNDATION OF THE EDUCATIONAL TECHNOLOGY POLICY

#### I. Preparatory Stage

1. Set up a Preparatory Team (assisted by Temporary Teams) to establish an order of priorities and plan for developments.
2. Initiate contacts with local educational institutions to establish their educational technology requirements.
3. Conduct studies in curriculum and methodology practices; (if these are already available, check their relevance to the educational technology policy).
4. Conduct surveys to establish the nature, quality and quantity of educational materials available in the educational system. Carry out repairs, replacements and acquisition of educational materials essential for future developments.
5. Initiate In-training and In-service teacher training programmes in Educational Technology by revising the present Audio-Visual Media courses at the Colleges of Education to comply with the requirements of the educational technology policy.
6. Formally establish the Malta Educational Technology Centre to include the services now provided by the Audio-Visual Centre and the Visual Aids Office.
7. Establish the posts of: Inspector of Educational Technology, two Educational Technology Specialists and one technician.
8. Allocate premises for the Educational Technology Centre, and start recruitment of its personnel.
9. Establish contacts with overseas organizations conducting similar work.

II. Establishment Stage

1. Appoint the staff established in I.6. The Preparatory Team will continue to serve the Centre in advisory capacity throughout the second stage, at the end of which, it will be dissolved.
2. Start project work on problems identified as of high priority.
3. Carry out regular visits to local educational institutions to help them solve problems related to the educational technology policy.
4. Initiate on-location In-service teacher-training in educational technology.
5. Initiate the build-up of the Centre's resource and production facilities.
6. Advise and help educational institutions to acquire educational materials, and extend their library facilities to include small resource and production centres.
7. Start the systematic production and distribution of educational materials.
8. Extend contacts with overseas bodies concerned with Educational Technology development.
9. Undertake the dissemination of Educational Technology information through regularly published newsletters, special-subject pamphlets, the mass media, and an on-demand-inquiry service.

III. Expansion Stage

1. Expand research and development programmes in the Centre's five areas of activity to plan for, or determine future growth.
2. Initiate research in curriculum and methodology through "experimental" classes.
3. Expand orientation activities to make the general public aware of the nature and aims of the educational technology policy, and the function of the Centre.
4. Expand further the resource and production facilities at the Centre to include an educational materials inspection area, and production equipment not normally available in educational institutions.
5. Start the production of multi-media instructional packages.

6. Make available the Centre's resource and production facilities to non-staff educators.
7. Extend the on-location in-service training programme.
8. Enlarge the permanent staff by two additional Educational Technology Specialists.

#### IV. Consolidation and Validation Stage

1. Analyse the Centre's projects for their effectiveness and reevaluate its objectives.
2. Extend activities in the development of educational institutions' resource and production facilities.
3. Conduct Research and Development programmes to establish the Centre's role in (a) Educational Broadcasting, (b) Continuing Education, and (c) Community Development and Cultural Enrichment programmes.
4. Advise, and where possible produce materials for, the public libraries system on the development of community multi-media resource centres.
5. Produce major multi-media educational programmes for the community.

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